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THE FOOTE COLLECTION

OF

INDIAN PREHISTORIC AND PROTOHISTORIC ANTIQUITIES.

NOTES ON THEIR AGES AND DISTRIBUTION

BY

ROBERT BRUCE FOOTE, F.G.S., F.R.A.I., M.V.I.,

SUPERINTENDENT, GEOLOGICAL SURVEY OF INDIA, RETIRED ; HONORARY MEMBER OF THE MINING AND GEOLOGICAL INSTITUTE OF INDIA ; LATE STATE GEOLOGIST IN BARODA AND MYSORE STATES ; HONORARY FELLOW OF THE UNIVERSITY OF MADRAS ; CORRESPONDING FELLOW OF THE GEOLOGICAL SOCIETY OF EDINBURGH.

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PREFACE.

THE collection of Indian Prehistoric and Protohistoric Antiquities referred to in the following pages was formed by the late Mr. R. Bruce Foote, F.G.S., during the course of a long residence in India. Mr. Foote joined the Geological Survey of India in September 1858, and retired as Senior Superintendent of the Survey thirty-three years later. The greater part of his service was spent in Southern India, the geology and palæontology of which he did much to elucidate by his investigations and writings. After his retirement he served for some years as State Geologist, Baroda, and as Director of the Geological Department, Mysore State.

By the discovery of palæolithic implements near Madras, in 1863, Mr. Foote became the pioneer of this branch of research in India, one in which he was later a recognised authority. During his long connection with the Geological Survey the ordinary routine of work entailed prolonged tours over a considerable part of Southern India, and much of his leisure was occupied in collecting all available material which tended to throw light on the habits and culture of prehistoric man. An extensive collection was thus accumulated, consisting for the most part of specimens found by Mr. Foote in the Madras Presidency and the neighbouring States of Mysore and Hyderābād, but also in Baroda and other parts of Northern India; to these personal finds a few others from various Indian localities and from Ceylon were presented by friends, or added by exchange.

The entire collection was purchased by the Madras Government in 1904, and a special room was built for its reception in the Art and Ethnological Section of the Madras Museum. At the same time it was arranged that a descriptive catalogue of the collection should be prepared

for publication by Mr. Foote. By the end of 1908 the specimens had been numbered and arranged, but the completion of the catalogue was retarded by ill-health and failing eyesight which clouded the remaining years of Mr. Foote's life.

Mr. Foote died on 29th December 1912, aged seventy-eight years. The catalogue had already passed through several proofs which were revised by the author, but a considerable amount of revision has still been found necessary. On checking the numbered specimens in the collection with the corresponding entries in the Catalogue Raisonné, it was found that some of the former were missing, and as all efforts to trace them have failed they are indicated by an asterisk prefixed to the catalogue number. On the other hand a certain number of specimens were found in the collection bearing numbers which do not appear in the catalogue, and such of these as could not with certainty be referred to any of the missing exhibits are shown in a case placed at the end of the series.

The catalogue appears in two volumes, the first of which is a descriptive list of the objects in the collection, arranged according to the districts and localities in which they were found. The second volume includes the author's notes on the ages and distribution of the antiquities, the plates and map, the general index and certain addenda written by Mr. Foote shortly before his death.

J. R. HENDERSON,
Superintendent, Government Museum.

MADRAS,
7th February 1914.

AUTHOR'S PREFACE.

A FEW words only are needful to explain how my attention came to be specially directed to prehistoric and protohistoric research in addition to the geological work forming my official duty.

In the early sixties of last century every one interested in the origin of mankind had been greatly stirred by the thorough confirmation by the great English geologists, Joseph Prestwich, John Evans, and Hugh Falconer, of Boucher de Perthes' discovery in the drift beds of the Somme river valley of chipped flint implements, the earliest human artifacts then known.

The news of this remarkable revelation had turned my thoughts to the necessity of looking out for possible similar traces of early human art in South India where my work then lay. It was therefore a matter of pure satisfaction, rather than great surprize, when, on the 30th May 1863, I came across a genuine chipped implement among the material turned out of a small ballast pit dug in the lateritic gravel on the parade ground at Pallavaram to the southward of Madras. The correctness of my recognition of the Pallavaram specimen as a genuine palæolith was fully confirmed by a great find of such artifacts, made in company with my friend and colleague Mr. William King, Junior, in the valley of the Attrampakkam nullah 40 miles north-west of Madras city. This was in September 1863. In January 1864 I had an opportunity of revisiting the Pallavaram ballast pit and found two further palæoliths of typical shapes in the material exposed by enlargement of the pit. Not long after I made several finds of polished neolithic implements, and then became a confirmed collector of prehistoric remains, thoroughly bitten with the desire to find more of these interesting artifacts, and my love for them has only gone on increasing during the forty-three

years that have elapsed since I discovered the first palæolith known in India.

As I never neglected a chance of preserving the specimens which came in my way, my collection grew in time to larger dimensions than convenient to keep in a private house, so when I retired from active service I offered it to the Government of Madras as I regarded the museum in that city as the fittest resting place for it, the great majority of the specimens having been found within the limits of the Presidency and the closely adjoining territories of Hyderābād and of Mysore.

The strenuous work necessitated by my geological duties very rarely allowed of my venturing on the excavation of graves and barrows, for they demanded an expenditure of time far greater than I could afford, if the excavations were to be carried on with great care, and hasty ones I regarded as utterly unjustifiable, so in the case of many groups of sepulchral monuments I could do nothing but examine the surface around them which rarely afforded any finds of interest, and I had regretfully to leave them unexplored, trusting they would come under the observation of the Archæological Survey before being desecrated and plundered by marauding gangs of Woddars.

The presence of many prehistoric and protohistoric sites is indicated only by vast quantities of broken pottery which, if carefully examined, frequently revealed the fact that the neolithic and iron age potters had often devoted much care and good taste in the decorative patterns they had bestowed on their handiwork and the colours of the pottery produced. The beauty of the pottery even when broken into mere shreds necessarily attracted attention to the skill of the potters. The earthenware vessels found in old graves at so many places in the south of the peninsula are, as a rule, far more perfectly preserved than those remaining in the old settlements, but *per contra* they show much less variety in shape, texture and ornamentation.

It was impossible not to be attracted to the study of the old ceramic industries, as a careful examination of their specialities could not but prove very helpful in determining the age of the dwelling sites. Many of the greatest living archæologists have great faith in the deductions made by students of the old pottery and besides that it must be remembered that they are by far the most numerous artifacts of the old peoples to be found.

The greatest value of the collection is the great light that it throws upon the geographical distribution of the people of the several ages. Of the many sites (459) whence I collected implements and other artifacts, 42 belong to the palæolithic age, 252 to the neolithic, and 17 to the early iron age, and of 5 the age could not be determined with safety or certainty.

The arrangement of my collection was necessarily a geographical one and the catalogue must of course follow the same arrangement. Separate chapters will be devoted to the several States and Districts in which finds were made by me, or from which contributions were given to my collection by friends interested in the study of archæology.

The discoveries of palæoliths and other prehistorics which followed on the above, will be dealt with in the chapters treating of the several Districts and States they were found in, beginning from the south and proceeding northward, in a necessarily sinuous line, in their geographical sequence.

R. BRUCE FOOTE.

ABBREVIATIONS AND TECHNICAL WORDS EMPLOYED IN THE NOTES AND CATALOGUE.

The numerals 1, 2, 3 or 4 after the descriptive name of celts, or other neolithic objects, indicate the stage of manufacture to which the specimen had been advanced by the original maker.

"1" signifies "chipped" or the first stage.

"2" signifies "pecked" or the second stage, when the angles of the several chippings had been broken down by pecking or hammering with a pointed stone, to reduce the quantity of material to be removed by grinding.

"3" signifies that the object had reached the third stage, by being *ground by friction in grooves generally found in the solid rock*, in the manufacturing sites.

"4" signifies *polishing* by which the implement was completed for use.

E.W. = Earthenware.

T.B. = Travellers' Bungalow.

F.B. = A bowl in shape like a modern finger glass or bowl.

B.I., B.O. = Black inside or black outside.

B. = Black.

R. = Red.

$\frac{B}{R}$. = Black over Red.

R.I. = Red inside.

The black and red colours often shade into each other, the black more frequently occurring in the upper part of the vessel and the red in the lower, presumably from the lower part having been better fired. Other colours as red-brown and brown are occasionally seen shading into the red and much less often into the black.

Sangam is the junction of two rivers, *e.g.*, the Narsipur sangam, the junction of the Cauvery and Kabbani, at Narsipur in Mysore.

"*Ownership markings*," scratchings on the surface of the finished vessel very various in shape.

The word "*Vessel*" is used when the specimen was too fragmentary to allow of a definite name being applied to it.

"*Tuyère*" (French), an earthenware cylinder, large or small, used to protect the nozzle of bellows against the action of fire. The tuyères themselves are frequently found fused at their points.

"*Joint planes*," fissures caused by shrinkage of heated rock masses, which very often give rise to the production of forms very suitable for chipping into celts and kindred implements. Pieces of trap rock with several convenient joint planes were much sought for by the celt makers, in order to save themselves great labour.

"*Cacholongs*," dark siliceous stones, the surfaces of which have become hydrated by weather action and have assumed a white or grey colour.

"*Ar*," short for aru (Tamil), a river.

"*Er*," short for eru (Telugu), a river.

Prant, a district or province, Gujarati term.

Tappas, small outlying tracts of territory in Gujarat and Kathiawar.

"*Selected stones*," stones foreign to the locality where found and brought from a distance to be manufactured into flakes, scrapers, etc. They are often of bright and pleasing colours.

Slip, a coating of colour wash applied to pottery.

Linchet, a small clearing on the top or sides of a generally rocky hill, frequently covered with turf and often revetted on its lower slope. Such clearings are common on the castellated granite hills in the Deccan.

The terms used to describe the material of which the neolithic celts and larger implements have been manufactured are only popular, being descriptive of their external appearance and not strictly petrological. Their exact determination was impossible, as the specimens could not be broken to furnish fragments convertible into sections for microscopical examination.

By the term *Basalt*, a very close-grained dense black rock is meant which might perhaps be called a diabase petrologically.

The name *Diorite* is given to a distinctly coarse granular material, showing two principal constituents slightly different in colour, blackish and grey.

Hornblendic schist is a name descriptive of a very fine grained delicately laminated rock, generally dark black in colour and showing a high polish in well finished specimens.

Trappoid is material intermediate between basalt and diorite and generally of black colour.

Greenstone is a greenish variety of diorite.

As it is necessary in some cases to give definite names to the colours of the specimens, I refer wherever possible to the tints shown by the dry cakes of water-colours in a colour box, *e.g.*, yellow ochre, raw sienna, burnt sienna, etc., but there are of course many specimens of intermediate shades which have to be indicated by description, as for example chocolate, brown sienna (intermediate between raw and burnt sienna), etc.

The arrangement of the specimens is geographical.

"The record of the human past is not all contained in printed books.

"To collect the implements, weapons, pottery, costume and furniture of races is to contribute materials not only to the history of mining, metallurgy, spinning, weaving, dyeing, carpentry and the like arts which minister to civilization, but also to illustrate the physical history of the countries where these arts were practised."

Sir C. T. NEWTON,
"On the Study of Archæology."

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THE FOOTE COLLECTION

OF

INDIAN PREHISTORIC AND PROTOHISTORIC ANTIQUITIES.

A.—INTRODUCTION.

PREHISTORIC artifacts should be treated historically, and be assigned respectively to one or other of the several stages of man's progress in civilization. Of these stages, I feel bound, after long study, to recognize four as occurring in India; they are as follows:—

I. The *Palæolithic*, or rude stone, *age*.

II. The *Neolithic*, or polished stone, *age*.

III. The *Early Iron age*.

IV. The *Later Iron age*, in which other metals became known, such as gold, tin and copper, as also the making of alloys of copper and tin or bronze. This age passed down into the protohistoric age, and became thus the link between the prehistoric and the present day civilizations.

In the first, or *palæolithic age*, man was not only unacquainted with any of the metals, but he was also ignorant of the art of grinding and polishing, and prepared his weapons and tools only by chipping hard stones of convenient size and shape with strikers made of other stones, so as to produce sharp edges and points which fitted them for many useful purposes. **Palæolithic age.**

No human crania of this age have as yet been found in India, nor any traces of domiciles, nor of the method of disposing of the dead. Palæolithic men were probably acquainted with fire; but traces of their having used it and of their habitations are wanting. It is probable they were cave-dwellers; but there are but very few caves in South India.

After a time, probably of great duration, some race of men discovered the art of grinding and polishing chipped implements, and produced a great variety of them of many different shapes, for manifestly different uses. These have been called *neoliths*, **Neolithic age.**

and the age the *Neolithic age*. Many of them show no little idea of beauty of form and finish. For a number of minor purposes, however, neolithic men prepared a great variety of small tools by very cleverly chipping hard siliceous stones, such as chert, flint, agate and jasper, which in many cases had to be brought from great distances, and must have been procured either by travel, or by barter with the residents of the regions where such stones occurred in nature. These smaller implements were never ground and polished; among them were knives, saws, scrapers, drill heads, flakes of sorts and doubtfully arrow-heads. Many cores, or nuclei, occur, but they are really rejecta, though undeniable proofs of much work done by their makers. This neolithic people, not without reason, changed the material used for their weapons from that used by their precursors and possible ancestors, which had been quartzite, and in its place adopted generally basic trap, an equally hard but tougher stone, more easily trimmed and, moreover, much more widely distributed over a great part of the peninsula. This second stone age, which is well named the *neolithic*, saw great advances in civilization, not only in the improved arms and tools, but also in the discovery of the art of firing the vessels constructed by skilful potters out of plastic clay. The Indian palæolithic people had apparently been quite ignorant of this art.

Yet another great advance appears in this age, namely, the domestication of animals. The remains of bovine animals are common in the neolithic sites which have remained to the present day, and traces of the horse and sheep were also met with here and there. As they had cattle to slaughter for food, they had doubtless learnt how to make use of cow's milk, which must have proved an accession of great value to their dietary.

Neolithic houses.

No traces of neolithic habitations came under my personal observation, and I have seen no accounts of such by any other observer; but there is evidence in various places of neolithic men having made use of convenient rock shelters on the granite hills which form isolated fastnesses rising abruptly out of the plains of the Southern Deccan. Their houses were in all probability constructed of perishable materials and disappeared by fire, natural decay, or the ravages of white ants. Their method of disposing of the dead was most probably by cremation, which would account for the great rarity of human bones in the neolithic regions.

Early Iron age.

In the third stage of prehistoric civilization, the art of smelting and working iron was introduced, and gave it the name of the *Early Iron age*. This was the greatest advance made in arts and crafts since man's appearance on the earth. The much greater

ease and rapidity with which weapons and tools of greatly improved quality could be produced by the working of iron caused the manufacture of stone implements of the larger and more expensive kind to be given up in very great measure. From the evidence afforded by several old sites in the Deccan and Mysore, it is a very reasonable inference that the iron workers were the direct successors and probably lineal descendants of the neolithic people as will be shown further on. In fact the ages overlapped.

Later Iron age.

As the fourth stage of civilization, *the Later Iron age*, we reach a period in which we find Indian man had become acquainted with certainly three additional metals, gold, copper and tin, and had discovered how to make that most useful and important alloy, bronze, which played so important a part in Europe prior to the introduction of iron making. Lead and silver also came to be known and used by this time.

The Breeks collection exhibited in the Museum, and catalogued by me in the volume dealing with the prehistoric antiquities of the Museum, certainly favours this view, which is also supported by the Tinnevelly collection excavated by Mr. Rea of the Archæological Department, as far as I know it in the absence of a catalogue.

Of the several divisions of prehistoric time, the neolithic first attracted attention by its megalithic monuments, which struck the attention of even the Aryan invaders and their Dravidian contemporaries, and gave rise to many fabulous legends to account for their remarkable shapes and size. Many of the megalithic remains are admirably described in James Fergusson's great work,[1] while others are figured and explained in the pages of the Indian Antiquary, and of the Journals of the Asiatic Society, the Bengal Asiatic Society, the Madras Literary Society and other scientific bodies, to which reference must be made.

It is difficult to determine whether there were any early finds of neolithic implements, but it is certain that Mr. H. P. Le Mesurier's paper on the celts which he found in large numbers in the valley of the Tonse river, in January 1860, communicated to the Bengal Asiatic Society in 1861, was the first recognized notice drawing attention to these very interesting survivals of the polished stone age. His paper, which was in the form of a letter to the President of the Society[2], is one of

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[1] "Rude Stone Monuments in all Countries," 1872.

[2] See Proceedings for February 1861 of the Asiatic Society of Bengal, letter from H. P. LeMesurier, Esq., Chief Engineer, East Indian Railway, to A. Grote, Esq., C.S.

great interest and well worth reading, but too long for quotation here.

Palæoliths at Pallavaram near Madras.

Mr. LeMesurier's very interesting and important discovery was followed in 1863 by mine of palæoliths south of Madras (30th May), and later in the same year (28th September), my colleague, Mr. Wm. King, Junior[1], and I discovered jointly the very important palæolithic locality at Attrampakkam[2] on the banks of the nullah falling into the Corteliar river 2 miles to the south-east. It was very shortly after this that I obtained my first neolithic implement, half of an "oval ringstone" or "mace head" of basaltic stone, which had once been well polished. I found it in a rain-gully between Sattavedu and Roshanuggur[3]. My second was a well-made celt lying on the surface on the north side of the Corteliar opposite Takkool 5 miles south-east by east of Arkonam railway junction. The celt from its position appeared to have been washed down the slope by heavy rains from higher ground from some half-destroyed Kurumbar rings, but I could not decide whether it had been actually derived from them, and neither could I be certain whether the ringstone mentioned above had been washed out of some ruined kistvaens lying similarly on higher ground at no great distance. If neither of these finds were connected with the kistvaens and Kurumbar rings, then these particular structures yielded nothing whatever to show what exact age they belonged to.

Neoliths in Sattavedu taluq.

The region to the north and north-east of the Attrampakkam site abounded in palæoliths, many sites yielding specimens washed out from the laterite, while in many others I chiselled out palæoliths from the lateritic rock, which was so hard that the extracting them unbroken involved a good deal of care and hard labour.

In the next year 1864, I completed the survey of the Madras area down to the Pālār, and in so doing came across many localities in which I met with palæoliths, all of quartzite.

The further south I carried the work from the Corteliar valley and the great quartzite shingle conglomerates, the rarer became the palæoliths, while in the taluqs of Chingleput and North Arcot districts, south of the Pālār, which were surveyed by my colleague, the late Mr. Charles Æ. Oldham, none appear to have been found. The most southerly locality in the Chingleput district at which palæoliths have been found is Walajabad, in

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[1] Afterwards Dr. King, Director, G.S.I.
[2] Numbaucum of Atlas sheet No. 78.
[3] Sites in Sattavedu taluq.

the Pālār valley[1], and one of these which the finder gave me is in the collection.

An important discovery was made by Mr. C. Æ. Oldham in the Rayachóti taluq of Cuddapah district of a large number of palæoliths occurring in thin lateritic beds at a high level. This find was made in 1864; and further examples of the kind were collected by me when making a revision of the survey of that region in 1891, and several of these are included in the present collection. See page 106.

Palæolith in the Narbada ossiferous gravels at Bhutra.

A discovery, which was regarded as of great interest because of its assisting to determine the geological age of the palæolithic folk, was made in 1873 by Mr. Hacket of the Geological Survey, who found a true palæolith *in situ* in the ossiferous gravels of the Narbada. This specimen was described by Mr. H. B. Medlicott and figured in the Records, G.S.I., Vol. VI, 1873, page 49, and also in the Manual of the Geology of India, first edition, Plate XXI. It is a very typical pointed oval implement, which, having a sharp edge all round, cannot have been used in the unprotected hand, but must have been furnished with a handle of some kind. It occurred on the left bank of the Narbada near Bhutra, eight miles north of Gadarwara station on the G.I.P. Railway.[2]

Neolithic megaliths.

Very interesting notices of some examples of megalithic monuments in the Deccan are to be found in the pages of the Transactions of the Royal Irish Academy, Vol. XXIV, p. 329, in a paper by Colonel Meadows Taylor, and also in his charming "Story of my Life." Another excellent paper on this subject was published in the Journal of the Anthropological Institute for August 1877 by Mr. Walhouse, Madras Civil Service, retired.

Not being a photographer, I have no illustrations to offer of the megalithic graves, trilithons and dolmens that I came across. Objects of the kind which might have been worthy of a photographic snap shot were not sufficiently interesting to induce me to make good and carefully measured sketches. For one thing I only came across very few which deserved to be pictorially recorded. A good series of large-sized photographs of the most remarkable megalithic groups known in South India would, however, be a valuable addition to the objects in the prehistoric room; become a memorial of structures of great interest, many of which will probably be destroyed ere long unless placed under special protection of the district authorities; and would further

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[1] These were discovered, a few years ago, by Mr. J. R. Henderson, then Professor of Biology, Christian College, Madras, and now Superintendent of the Madras Museum. His finds were typical palæoliths of quartzite.

[2] See Addendum No. I, for the associated fossils.

be very useful in helping to preserve in their proper position or restore to the structures slabs or blocks which have slipped or fallen out of place from age or accident.

A brief verbal communication to the Bengal Asiatic Society regarding the great importance of my discovery was made by Dr. Oldham in December 1864, and created much interest.

An extensive collection of quartzite palæoliths was made from a shingle bed at Kirkumbadi on the north-west line of the Madras Railway by the late Mr. W. R. Robinson, C.E., not very long after Dr. King's and my great find at Attrampakkam. His palæoliths were mostly larger and far coarser in make than the Attrampakkam specimens. I do not know their fate.

Palæoliths in some number and all of quartzite were found *in situ* in the laterite along the right bank of the Corteliar river to the westward of the Madras-Nellore high road. Specimens were chiselled out of the hard rock by Surgeon-General Cornish, Mr. W. Fraser, and myself.

A few specimens were also found by me on the little laterite outlier north of the river close to the village of Manjakaranai and a few more among the debris talus around the outlier.

Much imformation about the various sites at which palæoliths were found in the Chingleput district and adjacent parts of North Arcot is given in my memoir on the geology of parts of those districts, forming Part I of Vol. X of the Memoirs of the Geological Survey of India, published in 1873—*Vide* also Addendum No. III.

B.—GENERAL NOTES.

1. THE WEAPONS AND TOOLS OF THE PALÆOLITHIC PEOPLE.

That the old stone folk must have required weapons wherewith to fight their enemies, whether human or animal, and tools for the preparation of their weapons, and further tools and weapons as the old ones wore out, are three self-evident propositions; and there exists a certain amount of positive information as to the wants they strove to supply in the nature and forms of the weapons and tools which have descended to the present day. A study of these furnishes by inference the only clues to the stages of civilization which had been attained respectively by the peoples of the several prehistoric ages. These inferences must necessarily be insufficient in number to give even an approximate idea of the sociology of the several races under consideration. Like the geological record of life, which is full of gaps, the archæological record is necessarily imperfect in many respects; but many of these gaps will certainly be filled up by the researches of the rising generation of archæologists.

One great cause of the imperfection of the record for palæolithic man is the exceeding scantiness of the quaternary deposits in the peninsula, which are extremely poor, as compared with the parallel series in Europe, especially in France, Belgium and Switzerland, in which countries the many caves and rock shelters frequented by early man have safeguarded all manner of artifacts as well as human skeletons, which have not in India been similarly preserved.

Human remains in river alluvia.

Human bones have, however, been found in more recent deposits, for instance in the alluvium of the Gundlakamma river in the Guntúr district, 8 miles north of Ongole.[1] In the alluvial cliff here I found a human lower jaw imbedded in an undisturbed bed of loamy sand between 18 and 20 feet below the present surface. Other bones belonging probably to three individuals were extracted from a slightly higher level and all sent to the Geological Survey Museum in Calcutta. No implements or pottery were found in the alluvium, and the bones belonged in all probability to people drowned in big floods—(*vide* Memoirs, Geological Survey of India, Vol. XVI, page 96).

1 A little to the east of the crossing of the great North Trunk Road.

No human bones were found by me in the alluvia of the Kistna and Tungabhadra or of any of the rivers, large or small, south of the Gundlakamma, though I most carefully inspected their cliff-faces, wherever accessible, and tramped many hundreds of miles with that object.

No habitations of palæolithic men have as far as is known survived to the present day in Southern, Central and Western India; and from their weapons and tools now remaining the fairest inference would seem that they were an uncultured people but not gross savages, their artifacts in stone being in kind more numerous than, and in shape and make far superior to, those of the Tasmanians and Australians, when first visited by Captain Cook and contemporary navigators and the earliest British colonists. No crania of the Indian palæolithic men have been found as yet nor, with one possible exception, any other parts of a human skeleton. The one bone in question was found by me in the Attrampakkam nullah, an affluent of the Corteliar, a small river falling into the sea 11 miles north of Madras. The nullah cuts across a low plateau of lateritic conglomeratic shingle containing large numbers of quartzite palæoliths. The bone referred to had seemingly been washed out of the conglomerate and lay in the dry bed of the stream, together with a very large number of excellent implements, when first seen by Dr. William King and myself. We there made probably the largest and best collection of these ancient weapons ever made in India. Large collections were subsequently made elsewhere by other collectors at other places, but none equalled in quality the Attrampakkam specimens.

A possibly palæolithic human bone.

To return to the bone above mentioned; it was seen by Professors Busk and Boyd Dawkins, two very distinguished osteologists, when I returned to England and read two papers on my discovery of palæoliths in the coast laterite of Madras, one to the Geological Society of London and the other to the Prehistoric Congress held at Norwich in 1868. In the opinion of the two Professors, the bone, which had unfortunately lost both articulations, might possibly be part of a human tibia with the platycnemic deformation found in people given to squatting on the ground. The determination could not be regarded as absolute owing to the imperfect condition of the specimen.

Palæoliths of quartzite mostly.

The vast majority of the palæoliths were made of quartzite, which was by far the most suitable material occurring in South India. For, not only was it the most suitable, but on the East Coast north of the valley of the Palar river, it was far and away the most plentiful, material; the great shingle beds of different ages of the Jurassic rocks (the Rajmahal series), the Sripermatur and

Sattavedu series of the Madras country, afforded inexhaustible and widespread supplies of splendid shingle, which the palæolithic folk seem to have preferred greatly to masses of quartzite broken off from the vast beds of that rock which give rise to the enormous scarps, which figure so strikingly in the Cuddapah and Kurnool systems, as seen in the Nagari mountains and the Vellikonda and Nallamallai ranges of the Eastern Gháts.

Of jaspery hæmatite quartzite.

In the centre of the Deccan plateau near Bellary and thence southward into Mysore, a region where true quartzite is absent or very rare, the old people made their weapons of jaspery hæmatite quartzite, the next best material procurable; and here too they showed a preference for shingle of suitable size and shape.

Of quartz.

Quartz was very rarely used by the palæolithic people (though in itself quite a sufficiently hard stone), because it lends itself very badly to being chipped into any shape. I met with very few examples of it, but Dr. W. T. Blanford met with a good number at Ragundla in the Godávári Valley. In Central India the old people made their weapons out of quartzite as a rule, but typical palæoliths have also been found in the Rewah country, made of porcellanite which is found in that region and furnishes a by-no-means unsuitable material; Nos. 4078, 4079 and 4080 are made of it, and the first of these is figured in Plate 2. See page 161.

Of porcellanite.

The palæolithic forms recognized are at least ten in number,[1] clearly designed for different purposes as indicated by their varying shapes. The leading shapes are pointed ovals, *e.g.*, Nos. 2204_9, 2204_{10}, 205 and 2204_{21} figured in Plate 1. These show considerable differences in the proportion of their width to length, and all have sharp edges all round which would

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[1] The forms to be distinguished are as follow :—

Axes	1. Pointed oval.
	2. Oval.
	3. Square edged. (Madras type.)
	4. Oblique edged. (Guillotine subtype.)
Spears	5. Narrow type.
	6. Broad based type.
Digging tools ...	7. Pointed with thick pebble butts.
Circular implements	8. Hurling stones with sharp edges all round.
Choppers ...	9. Pointed oval with sharp edge on one side only.
Knives	10. Long narrow flakes with parallel sharp sides.
Scrapers ...	11.
Cores ...	12.
Hammer stones	13.
Strike-a-lights ?...	14.

The shapes Nos. 11 to 14 are less certainly admissible as designed forms and therefore as real artifacts.

prevent their being used in the unprotected hand. They were in all probability fitted into cloven handles and securely lashed with gut or strips of wet hide or strong vegetable fibre; but no type of hafting was preserved in the deposits in which the implements came to be buried.

Madras type of palæolith.

A remarkable form of palæolith, which was long ago distinguished as the "Madras type," is the axe-form figured in Plate 1 —Nos. 2204-7, 2204-8 and 3248, all made of quartzite, the last of a very coarse gritty variety. In all of this type, which is not a very common one, the cutting edge is produced by the meeting of two flake surfaces, each produced by one blow and not by a number of small chippings, which never result in so sharp an edge. The oblique cutting edge as in No. 2204-7 is met with sufficiently often to justify describing it as a special sub-type, the "Guillotine" sub-type. It would have made a very handy tool in trimming away charred surfaces, if the old people went in for the manufacture of dug-out canoes with the aid of fire, as was so largely done by many of the South Sea islanders.[1]

Spear head type of palæolith.

They had also spear heads which, when fitted to suitable shafts, would have been very formidable thrusting or stabbing weapons. A very excellent example of this type is No. 2204-5, Plate 1; and two capital weapons of the kind were figured by me in my first paper on the subject in Plates 1 and 1 (*a*) and 2 and 2 (*a*) in the Madras Journal of Literature and Science for 1866.

No. 2204-22 in Plate 1 is a more specialized form, sharp pointed and sharp sided, with a very short pebble butt, which might very well have served as a spear head and could, if mounted in a cleft pole and properly lashed, have been used as a very formidable heavy spear. A lighter form of spear might similarly have been constructed with No. 2204-5, which is the most sharp pointed Indian palæolith that I have met with. See Addendum No. IV.

Blunt-butt type of palæolith.

The implements which may have been meant for use in the unguarded hand had thick butt ends with the original pebble surface left unchipped.

They constitute a very distinctive third type of implement which may have been used for agricultural purposes for digging up edible roots and bulbs and are well represented in Plate 2 of this volume, Nos. 305 and 309. As from their shape they could be wielded with the full force of their owner without any injury to the hand, they may have formed very formidable weapons in a hand-to-hand combat. Flake knives were among the tools made

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[1] See also the cut illustrating shafting of spear head.

and used by the old people, and apparently also true scrapers. If the scraper-like implements were used in the same way as tools of the same shape were used by the neolithic peoples and some of the backward tribes still living, we may infer that the palæolithic race of men made use of the skins of animals they killed in the chase or in self-defence.

Flake knives and scrapers.

A stone less well adapted for the manufacture of implements than quartzite, but yet sometimes used, was a siliceous limestone, a fine palæolith made from which is illustrated in Plate 2, No. 2894. I obtained it from a very remarkable talus occurring at Yeddihalli west of Surapur in Hyderābād State. See page 122.

Palæolithic peoples, their condition.

No traces of the use of fire have, so far as I know, been met with in deposits containing the oldest chipped stones, but their makers must have known it; nor have any traces of their old habitations been found anywhere in India and recorded. Similarly, no traces have been found of the manner in which they disposed of their dead. Only a solitary fragment of bone supposed to be human was found at Attrampakkam by myself in 1863 and is referred to above. No human skulls of palæolithic age are known to have been found in India; so it is impossible to speculate upon the physique of the old palæolithic people. No traces of pottery have been seen with any of the finds of implements so numerously made in Southern, Western or Central India. From the shapeliness and good workmanship, however, of many of their weapons and tools one can only infer that they were a distinctly intelligent people. Should any lucky find be made in the future of a cave containing traces of man in a well-preserved state, we may well expect to find artifacts of a quality fully equalling those met with in the older French, Belgian and British bone caves.

Their habits and practices.

As already mentioned, no palæolithic habitations have remained to the present day in Southern India; and likewise no signs of the mode of burial, whether inhumation, cremation or exposure of the corpses, and no objects in any way indicative of religious thought were found in connection with palæoliths. There are very few caves in South India, and in but one of them were remains of palæolithic age found when explored in the eighties by my son Lieutenant (now Lieut.-Colonel) Foote, R.A., and myself, but chiefly by the former, as I was called away urgently on other duty.[1]

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[1] The remains here referred to are a few carved bones and marked teeth of Magdalenian aspect which will be described in the Records of the Geological Survey of India, as they belong to that department. The small box containing them was lost sight of for several years, but was found again quite lately.

Of wooden artifacts of palæolithic age no trace has been discovered as yet; indeed none could reasonably be expected in view of the prevalence of termites (white ants) and their phenomenal voracity.

Wooden comb preserved in white ash.

The only wooden prehistoric object of any age that I know to have escaped to modern times in its entirety was a small wooden comb discovered by my friend Mr. Cornelius Cardew, C.E., when in charge of the Southern Mahratta Locomotive Works at Guntakal junction in Anantapur.[1] This comb escaped the greed of the white ants because imbedded in a layer of white ash, a substance they hate intensely as contact with it greatly disagrees with their soft moist bodies. Mr. Cardew, after I had the pleasure of introducing him to an interesting neolithic site a little to the south of the railway, made some interesting and successful excavations and found an iron and bronze age site adjoining the neolithic one and from it obtained a valuable series of earthenware and iron articles, Nos. 1220 to 1268 of the prehistoric collection catalogued by me for the Museum in 1901.[2]

In view of the nature of the Indian fauna and of the great size and ferocity of many of the larger animals, it has been thought by some people, and not unreasonably, that palæolithic man was very badly provided with means wherewith to protect himself and his kind against the wild beasts which shared the country with him. If the old people had no other weapons at command than the palæoliths, even well and securely mounted and hafted, they would certainly have been heavily handicapped against their foes, but it must not be forgotten that they could have constructed very effective weapons out of the hard woods which grow so freely in many of the forests, such as "*Hardwickia binata*" or "Acha" of the Tamil people, and "Yepi" of the Telugus, an extremely hard and very durable dark red wood. It grows freely in the Eastern Deccan, a region largely frequented by the palæolithic men. Another very similar wood is the *Xylia dolabriformis* also growing in South India, the Ironwood tree of Pegu and Arracan.[3] It is dark brown or reddish brown in colour.

Hard wood spears.

These excessively hard woods could be worked into spears with extremely sharp points and of sufficient size to be very formidable weapons of offence, if wielded by strong and active men

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[1] A small remnant of prehistoric wood is described in Addendum No. XXII.

[2] *Vide* the Catalogue of the Prehistoric Antiquities in the Madras Museum drawn up by me and published by Government in 1901.

[3] *Jambu* in Hindi; *Irúl* in Tamil; *Eruvalu* in Telugu.

and especially so if a number were so armed and acted in concert. Clubs, too, of the largest size could easily have been prepared by uprooting young trees of many kinds and trimming away the tops and the thin roots.

Savages of the Makran Coast armed with wooden spears.

A most interesting instance of the actual use of such wooden spears is quoted by Sir Thomas Holdich from the log of Alexander the Great's admiral, Nearkhos.[1]

"It was at the mouth of the Hingol," draining the Las Bela Valley, writes Sir Thomas Holdich, "that a skirmish took place with the natives which is so vividly described by Nearkhos, when the Greeks leapt into the sea and charged home through the surf. Of all the little episodes described in the progress of the voyage this is one of the most interesting; for there is a very close description given of certain barbarians clothed in the skins of fish or animals, covered with very long hair, and using their nails as we use fish-knives, armed with wooden pikes hardened in the fire, and fighting more like monkeys than men. Here we have the real aboriginal inhabitants of India. Not so very many years ago, in the woods of Western India, a specimen almost literally answering to the description of Nearkhos was caught whilst we were in the process of surveying those jungles, and he furnished a useful contribution to ethnographical science at the time. Probably these barbarians of Nearkhos were incomparably older even than the Turanian races which we can recognize, and which succeeded them, and which, like them, have been gradually driven south into the fastnesses of Central and Southern India."

Æonic tinting of palæoliths.

Palæoliths which have been exposed for long periods to atmospheric influences will be seen in many cases to have acquired a peculiar surface lustre analogous to the patina on metallic surfaces. This change in the case of the palæoliths found on the plateaus above the banks of the Nile, which are much weather-stained, has been aptly called by Professor Flinders Petrie, "Æonic Tinting." It shows best on implements made of fine grained material like flint, far more so indeed than in those made of quartzite or hæmatite jasper. The tinting is well seen in the series shown in the Cairo Museum.

A list of the localities which yielded palæoliths will be found on pages 167, 168 and 169.

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[1] See Colonel Sir Thomas Holdich, K.C.M.G., K.C.I.E., C.B., "*The Gates of India*," page 157; an admirable work.

2. THE SUPPOSED EOLITHIC PEOPLE.

The type of ancient artifact which was supposed to have preceded the palæolithic age, and is now the cause of so much discussion and such very strongly opposed opinions, has not to my knowledge been as yet met with in India. I myself have certainly not yet found one, nor seen or heard of one found by any one else. Possibly the type will yet be found. Why this form of stone implement should not have been produced by the prepalæolithic people of India, if such a people there was, is a puzzle hard to explain, for various kinds of siliceous stone nearly approaching flint in its peculiar and special form of fissibility are to be found in different parts of the peninsula, to wit, the many forms of chert in the Cuddapah and Kurnool systems, the jaspers of the Dharwar system, the agates of the Deccan Trap, and lastly, the true flints found in the valley of the Vellar river in the north-eastern part of Trichinopoly district. Flint is also procurable in Sind and was there used by the neolithic people to form knives of different sizes, many remarkably fine specimens of the cores resulting from the manufacture of the flake-knives having been found at Rohri on the Indus, *e.g.*, Nos. 4051, 4052 and 4053.

The subject of the human origin of eoliths, despite all that has been written upon it and the great discussion it has given rise to, *e.g.*, the discussion on Mr. S. H. Warren's lengthy paper [1] read before the Anthropological Institute in 1905, has been left so thoroughly unsettled that the matter need not be gone into here, though at the Archæological Congress at Monaco held in 1906, much more faith in the truly human origin of these remarkable objects was displayed than might perhaps have been expected.

When at home in 1902, I had the good fortune to see in Oxford Mr. Montgomery Bell's splendid collections of eoliths and a grand series of palæoliths found by him in the Thames valley; while through the kindness of Dr. Smith Woodward, F.R.S., I had been able to study Sir Joseph Prestwich's fine collection of eoliths in the Natural History Museum very thoroughly.

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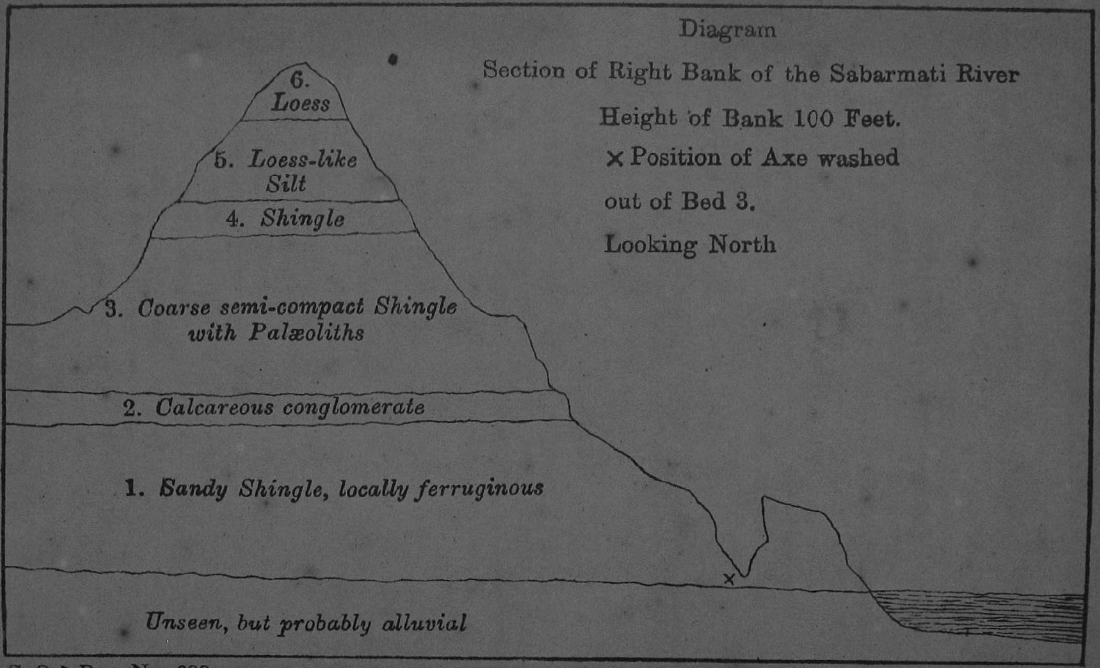
[1] "On the origin of eolithic flints by natural causes especially by the foundering of drifts." Journal of the Anthropological Institute, 1905.

Vide also Worthington Smith's paper on eoliths in "Man," 1908.



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3. THE HIATUS BETWEEN THE PALÆOLITHIC AND NEOLITHIC AGES.

This is a theory which has met with the approval of many of the most experienced and leading prehistoric archæologists, foremost among whom stood the late Sir John Evans, K.C.B. The theory is that a vast lapse of time occurred between the latest appearance of the work of the palæolithic people and the first appearance of the work of the neolithic people. Sir John, in the last pages of his great work "The Ancient Stone Implements, Weapons, and Ornaments of Great Britain," argues most ably the point that such a great gap, or hiatus, did really occur in Western Europe, and it appears to me that the real existence of a similar gap is strongly supported by the geological features shown in the annexed section of the right bank of the Sabarmati river in Gujarat. Typical palæoliths were deposited by flood action in a bed of coarse shingle over which more than 50 feet of other alluvial materials were piled by the action of the river, and over this again nearly 200 feet in thickness of blown loess was heaped by the westerly winds from the Gulf of Cambay and the Rann of Cutch. It was on the top of the high level loess which occurs in the shape of small plateaus at intervals capping the high alluvial banks or on the top of isolated loess hills away from the river that the neolithic people left the earliest traces of their advent in the shape of flake-knives and wedges, with scrapers, strike-a-lights and a variety of interesting selected stones. Then a change took place and the river ceased to deposit and began to cut away its older alluvium to a depth of more than 100 feet as shown in the annexed section. Very little deposition has taken place of late and that only of fine sand or clay which lies in quite little beds at foot of the old banks here and there.

Section of the right bank of the Sabarmati river opposite to Sadolia.

The very fine palæolith, No. 3248, of the Madras axe type, which I have figured in Plate 1,had been washed down from the lower part of bed No. 3 of the section and lay at the bottom of a little gully (marked X in the section), only a few yards from the edge of the water, which at the time of my visit formed a broad reach of rather deep water and prevented me from getting a front view of the bank which I wished to sketch. No boat was procurable locally, and the left bank was too distant to allow of a useful view being obtained by crossing the river higher up to the Sadolia side.

The section just described lies $8\frac{1}{2}$ miles south-east by south of Vijāpur in the taluq of that name in the Baroda State, but is not very easily approached because of many deep gullies cutting up the

river bank both to the north-west, west and south of the spot whence I procured the palæoliths under consideration. If proceeding south-east from Vijāpur, the best route lies *viâ* Mahuri and thence by a path running south and south-east to a little hamlet of the name of Kot, about half a mile south of which begins the cliff section. Immediately opposite the implement site stands very conspicuously on the top of the left bank a small temple belonging to the village of Sadolia, which lies 3 miles west of the small town of Parantij, in the Mahi Kantha country.

Pedhamli section. A shingle bed, the equivalent of No. 3 in the section, at Pedhamli 8 miles up the right bank, yielded a very good palæolith, shapely in form, of quartzite of remarkable coarse texture, No. 3309, which is figured in Plate 2. I found it on the shingle bed a few yards south of Pedhamli village. It had evidently come a long distance, for it was much rolled before being buried in the shingle bed No. 3.

Heights at which palæoliths have been found. The elevations above sea level at which palæoliths have been found in South India vary from only a few feet above high tide mark on the East Coast to about 2,500 feet around the Katharighar and Paizarghar Durg hills (in Belgaum District), two of the most westerly points to which the palæolithians (to coin a new but very useful ethnographic name) seem to have advanced.

The Alicoor hills, a palæolithic centre. The highest point near the East Coast at which I found palæoliths was on the Alicoor hills, a group rising to the height of about 500 feet. I came upon them on the south-western slope at a spot at an elevation of not less than 400 feet to which they had been brought by denudation from a somewhat higher part of the hill.

Many more localities yielding palæoliths, beside those shown on the map which accompanies this volume, will probably be met with by future observers and add to the knowledge of the distribution of the rough stone chipping people. It will be of great interest to ascertain whether the great Deccan Trap area was inhabited by the palæolithians, and whether those who dwelt in the central parts of the area were driven to make their implements from the local materials, or were obliged to procure their accustomed stones from, and had therefore to make expeditions to, the regions north and south of the Trap area, where the desired stones could be found in the rough and brought home to be worked into tools or weapons at leisure. If the necessity for having the accustomed quartzite, hæmatite quartzite, siliceous limestone or porcellanite was urgent and the personal expeditions were difficult, it may well have led to a system of barter for the rough material with the residents on the confines of the area, or the latter may have become implement makers and have traded with their produce.

Much light may be thrown on some of these questions, if the observer finding implements on working places have sufficient geological knowledge and acquaintance with the regions lying north and south of the trap area to decide upon the provenance of the material his finds were made of.

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4. WEAPONS AND TOOLS OF THE NEOLITHIC PEOPLE.

With the great change in the method of working their tools and weapons came an equally great change in the material the neolithic people selected, for they chose instead of the light-coloured quartzites favoured by the palæolithic people the dark blackish or absolutely black basic trap rocks occurring so largely in the hundreds of trap dykes traversing the gneissic and granitic regions or intruded into the younger overlying beds of the Dharwar, Cuddapah (Kaladgi) and Kurnool (Bhima) series of the Deccan. A probable reason for the change of material was the superior toughness and tenacity of the trappean rocks as compared with the quartzite. Whatever their reason for this great change, they observed it strenuously, for with only a very few exceptions the polished neolithic implements found or seen by me were all made of trappoid rock. To speak of celts and kindred implements only, my collection contains over 1,000 specimens ; and reckoning at a rough estimate those broken specimens left behind in the many old neolithic sites I visited, several thousand specimens must have been handled by me alone, to say nothing of those collected by other observers and preserved in other collections.

Great variety of neolithic artifacts.

The variety of implements and tools produced by the neolithic people is much greater than that fabricated by the palæolithic people, and a list which I have drawn up and give further on shows that to meet their wants they produced no fewer than 78 distinct artifacts, of which 41 belong to the ground and polished class, while the unpolished class contains a further series of 37. Many of the groups of artifacts, such as the celts, show numerous varieties in form of their kind. In the celt group, no fewer than 12 such varieties or types are distinguishable. Some of these types may have been due possibly to passing fashions, but others are referable to the special local development of the jointing of the material they were made of. The old stone workers were very keen on saving themselves unnecessary labour ; and in order to do this they sought for specimens of the rough material which were so shaped by the existence of joint planes as to approximate to the forms they desired to produce in the same way that

Selection of stones with intent to save labour.

their palæolithic predecessors (possibly actual ancestors) selected individual large pebbles that could be converted into shapely implements with the minimum of chipping. There are many examples in the collection of the selection of rock fragments conveniently shaped by joint planes, the presence of which must have very materially diminished the quantity of chipping requisite to produce good celts.

No. 1402, found on Sanganakallu, 3½ miles north-east of Bellary, is a very notable example of this, for here no less than five joint planes are present and would, if they had been fully made use of, have saved an immensity of labour to the chipper dealing with it. In this case, certainly, the existence of the joint-planes has caused the implement to be of really elegant shape, as will be seen from careful inspection of the figure in Plate 52. Very many other examples are present in which a smaller number of joint planes occur, and have been availed of to excellent purpose in the making of the implement.

The Gadiganuru type of axe.

One of the most interesting types of the celt group No. 992 in the collection, is illustrated in Plates 4 and 5. This is a form which may well be regarded as the prototype of the iron axes, specimens of which, Nos. 173, 174, and 192*a* are figured in Plates 19 and 50. It is a type which differs from all the rest in being broad and thin. All the examples of this type are made of fine-grained, hard, archæan trappoid schist, which appears in lenticular enclosures in the granite gneiss at and to the west of Gadiganuru in Bellary district, for which reason I shall call it the Gadiganuru type. This peculiar schist is a rock I met with nowhere else in the Deccan. No. 992, though the largest and most striking example of the type, is not a specially well-shaped celt, for the initial chipping was not carried far enough to make the surfaces of the broad sides really flat and smooth, and they were not well ground before being polished. Some of the others of the type were much more carefully finished off.

Indian celts why not perforated?

Another noteworthy celt is No. 99, a Shevaroy hill specimen, figured in Plate 3, which shows what may be regarded as incipient drill holes; but strangely enough no truly perforated celts have been found in India as far as I have gone or been able to learn from close enquiry. Why the drilling of this specimen should have been only just started and never carried any further, is an inexplicable mystery; but one thing is certain, namely, that if it had been completed, the result would have been a very badly balanced axe.

The reason why the Indian neolithic people did not drill socket holes for the handles of their celts is not easy to divine,

when they bored them through equally hard varieties of stone which they employed for their mace heads or ringstones, and made their thumbstones, carefully ground and polished oval flakers, by partially perforating them from both sides, as in No. 2900 from near Belgaum and No. 3396 from Kanja on the left bank of the Tapti river, which are the only specimens of the kind that I obtained. See No. 3396, Plate 19.

Notes upon other interesting specimens will be found further on when dealing with the localities of their provenance.

Caribbean hafting.

It would be an interesting point to elucidate if the old mace head makers were acquainted with a method of hafting their weapons by resort to a process followed by Carib tribes in the West Indies by which they secured excellent handles. The process was this; when the mace head was completed they took it into the forest, and having found a tree which would furnish a suitable handle, they cut off the end and twigs of the selected branch and slipped the head as far up the branch as it would go and left it there for a while. The continuing growth of the branch caused the wood to swell out and form nodes both above and below the head, and when these had become large enough to hold it in place immoveably the branch was cut off suitably, and a perfect club was the result. If the head became somewhat loose as the green wood shrunk, it was quite easy to tighten the mace head for use by soaking it in water for a while before use.

If this method of hafting was known to the Indian armourers of the neolithic time, it was forgotten by their descendants, for at the present day wood-cutters and even carpenters are singularly stupid about the hafting of their tools, whether axes or hammers and hoes of sorts, and it is almost impossible to get proper hafts for these tools.

Slick stones.

Another form of polished implement which should not be overlooked is the slick stone or slyking stone, examples of which were met with on the Shevaroy hills and elsewhere.

The slick stones were artifacts used in Europe long after the neolithic period had come to an end, as will be seen on reference to Sir John Evans's great work "The Ancient Stone Implements, Weapons, and Ornaments of Great Britain." They were made use of to give lustre and smoothness to woven materials while still in the loom.

A very good specimen in the collection is No. 165 made of hornblendic gneiss, a flattish oval with one side flat with a rounded edge. It retains a good deal of its original polish and is very shapely. It well deserves a figure, but was accidentally overlooked when the plates were being prepared.

Yet another very interesting polished implement which I regard as a net-sinker is No. 254, of whitish grey steatite, from Komaranahalli, 4 miles south-east of the great temple at Hallibid. It is figured in Plate 19. Despite being much weathered, as shown by the cavities left by acicular crystals of actinolite which have been weathered out, from long exposure to atmospheric action on the surface, it retains distinct traces of former high polish.

The following lists of the various implements and ornaments made by the neolithic people are of interest:—

Ground or carved, and ground and polished objects.

1. Adzes, 2 types.
2. Amulets.
3. Anvils.
4. Axe-hammers, 3 types.
5. Beads of many types and stones.
6. Buttons.
7. Celts of 12 types.
8. Chisels of 6 types.
9. Corn-crushers.
10. Cylinders.
11. Discs.
12. Figurines, human.
13. Do. animal.
14. Hammers, square.
15. Do. round.
16. Do. belted.
17. Hammer stones.
18. Hones.
19. Mace heads.
20. Marbles (Toys).
21. Mealing places on rocks *in situ*.
22. Mealing stones, 2 types, flat and rounded.
23. Mealing troughs, 2 types, deep and shallow.
24. Mortars.
25. Mullers.
26. Net-sinkers.
27. Palettes for rouge.
28. Pencils of steatite.
29. Pestles.
30. Pivot stones.
31. Pounders.
32. Polishing grooves.
33. Slabs for grinding.
34. Slick stones.
35. Stone, vessels of.
36. Do. do. of steatite.

36A. Tally stones.

37. Thumb stones.
38. Whetstones.
39. Phallus.
40. Pendants.

Unpolished artifacts.

1. Anvils, rough.
2. Arrowheads, 3 types.
3. Bone splitters.
4. Burins or graving tools, 2 types.
5. Cores, 6 types.
6. Discs.
7. Flakes, 5 types.
8. Flakers.
9. Knives.
10. Lance heads.
11. Lancets.
12. Mallets.
13. Potting stones for potters.
14. Pendants.
15. Saws.
16. Scalpels.
17. Scrapers, oval, large.

18. Scraper, small, round.
19. Do. extended.
20. Do. incurved.
21. Selected stones of many kinds and for various purposes.
22. Sling stones.
23. Spoke shaves.
24. Wedges, worked.
25. Wedges, unworked.

Note.—It is desirable to point out the peculiarities of the various types of celt-like implements, a group including adzes, celts, chisels and axe hammers.

Of the adzes, there are two types, a short and a long one, which latter, if well ground and polished, would be very closely akin to, or identical with, the Polynesian type, a facsimile of which was met with in a neolithic site in Hyderabad State and is figured in Plate 6 (No. 2655).

The several types of celts, 12 in number, which are recognizable may be described as follows:—

1. Celts with oval edges.
2. Do. square edges.
3. Do. narrow edges and cylindrical bodies.
4. Do. pointed butts.
5. Do. blunt butts.
6. Do. round sides.
7. Do. bevelled sides.
8. Do. square sides.
9. Do. square shoulders to reground edges.
10. Do. curved edges.
11. Do. short and thick body. Battle axe type.
12. Do. thin bodies, prototype of iron axe.

Of the chisels 6 well-marked types are to be distinguished—

1. Chisel with square bodies.
2. Do. cross cut edge and very thick body.
3. Do. thick triangular body.
4. Do. narrow thin body.
5. Do. broad with elliptical edge.
6. Do. sharp point.

Of axe-hammers 2 types should be recognized—

1. Axe-hammer with a long narrow body.
2. Do. short thick and broad body.

Rarity of stone arrow-heads.

A remarkable fact in connection with the neolithic age is the absence hitherto of finds of well-worked arrow-heads of chert, agate and jasper, the three kinds of siliceous stone common in Southern, Central, and great part of Western, India and which were so frequently and cleverly worked by the neolithic people and their descendants into implements and arms of larger or smaller character, such as scrapers, both oval and incurved, and other forms as drills and piercers, saws and knives and many pygmy implements.

Possible use of large thorns as arrow-heads.

That bows and arrows were unknown to so intelligent and mechanically skilful a people is most improbable, and the absence of such arrow-heads demands an explanation, which is not obvious at first sight. In explanation of the above strange fact I would offer the following theory which I think may prove acceptable

to many. My theory is that the neolithic people found it far easier to use as heads for their arrows large thorns, such as those of the babool or gum arabic tree and those of the *Acacia latronum*, both of these, trees of common occurrence in the Indian peninsula and very easily procured. The thorns of both are large, strong and exceedingly sharp and capable of making very serious wounds, if properly employed. For the shooting of small game such thorns would have made very effective arrows, if they had been somewhat weighted to make them balance the shafts, which were probably made of reeds of different kinds. The heads made out of the great hollow thorns of the *Acacia latronum* could have been very effectively weighted by boring a small hole through the side of the thorns, near their base, and filling the cavity with fine magnetic iron sand, which is procurable in thousands of stream beds in almost every part of the country, except absolute alluvia. It is a large constituent of the beach sands on either side of the peninsula. I have figured such a thorn in Plate 46, No. 193*a*.

The solid babool thorns could easily be weighted externally above their attachment to the reed or cane forming the shaft of the arrow. Arrow-heads of hard wood are said to be used for shooting fish by some of the fisherfolk on the Western Coast, and such may very likely have been invented by the archers of the prehistoric tribes. There has been no example found of such arrows, as far as I know, nor need that be wondered at seeing how all traces of wooden articles have been destroyed by the ubiquitous white ants. Out of all the thousands of prehistoric objects I have handled, or seen, in India, only two consisted of wood; the comb found by my friend Mr. C. Cardew, C.E., and the other, a small remnant of the shaft left in a metal spear headsocket. The surface of the latter shows that it had been gnawed by termites. It is in Colonel Branfill's collection in the lower gallery.

Pointed chert flakes.

A small number of pointed chert and agate flakes have been collected, which are held by some observers to have been arrow-heads. In my collection are a few such flakes from Ranchi in Chota Nagpur, which were sent me by my friend the late Mr. J. Wood-Mason, Superintendent of the Indian Museum. He was firmly convinced of their being true arrow-heads, but I cannot myself regard them as such, for they are too rude for my acceptance. I have found similar pointed flakes in other places, but regard them as very doubtful, in fact as nothing more than accidental forms. Only two or three specimens in my collection appear to me possibly genuinely worked arrow-heads, and these will be found described further on when dealing with the

localities they were found in. But I can only speak with perfect confidence of one, No. 3892, p. 151.

Colour perception of the neolithians.

The extent to which the neolithic people were interested in, and affected by, perception of colour is not easy to gauge, as few indications of their love of varying tints remain; still there are four facts from which inferences can be drawn. Firstly, the several tints they allowed their pottery to receive by varying the degree of firing they exposed the pots to. Secondly, the pigments they used to paint the different vessels the potters turned out were shades of red, yellow, brown and rarely orange and purplish grey. No pigments producing green and blue appear to have been known to them judging by the painted sherds. The black colour of most vessels seems to be due to their having been less highly fired, and this is confirmed by the fact that the black earthenware weathers much sooner than the red. Whether the grey colour of some vessels is due to the admixture of some foreign substance or to the clay employed being of a totally different kind, I cannot say, but if a piece of the grey earthenware were analysed some light on this question might be obtained.

Pigments used to paint pottery.

Love of epidote gay coloured stones.

The third fact to aid the comprehension of the neolithic colour appreciation is the great fondness the old folk had for pistacite granite with its mixture of green and pink colours and for chrome gneiss with its delicate greenish white and green tints. In many cases, specimens of these two rocks must have been fetched from great distances, though they would have served no better than the common country rock for the making of mealing stones and corn-crushers, for which they were generally used.

Selected stones chosen for colour.

The fourth fact, or seeming fact, lies in the very pretty and often quite gay colours of many of the selected stones gathered by the old people often from quite distant places, *e.g.*, the pleasing colours of the cherts and agates they collected to convert into drill head flakes, scrapers and strike-a-lights. It would be easy to make a long list of localities in the Deccan, Gujarat and Kathiawar, where veins of bright chert occur. One example of evident appreciation of a very lovely pale shade of emerald green amazon stone, felspar, obtained from a granite vein to be seen crossing the half empty bed of the Sabarmati, a few miles higher up the river, should be quoted. A number of this variety have been taken on the loess plateau east of Hirpura—see Nos. 3262 to 3269.

Reddle, an earthy hæmatite.

Attention must be given to the use of reddle in 13 neolithic sites in the Deccan. I found specimens of earthy red hæmatite, or reddle, which had been rubbed down to produce red powder which could serve as rouge, or be employed as paint if mixed

with some suitable liquid vehicle. Two small slabs which had apparently been used for grinding or rubbing down the reddle were also met with; one, a flat pebble of hæmatite schist, No. 421, from the Fort Hill, Bellary, and the other, No. 2738, of grey brown sandstone, found at Maski in the Raichur Doab.

Of the 13 sites which yielded reddle stones, 9 are in Bellary district, Nos. 377, 422, 444–31, 904, 1123 to 1135, 1257, 1427, 1516, 1546 and 1555, one in Mysore, No. 229, one in Anantapur, No. 2084, one in Hyderabad, No. 2878, and one in Baroda State, No. 2902. The shape of many shows that they had been ground very often or very largely.

Pintaderas of Ligurian caves.

Nothing has been found in India so far as I know in any way resembling the "pintaderas" found in the neolithic caves of Liguria. These are narrow terra cotta stamps used to apply colour, apparently prepared with red ochre, to the human skin—a style of personal decoration, which the neolithic people of Southern and Western India do not appear to have been addicted to.

No neolithic burials by inhumation being apparently known in India, it is impossible to determine whether in the painting of the bones of the departed a red colour was practised as was the case in the bone caves in Liguria, *e.g.*, the Balzi Rossi which lies just within the boundary of Italy, a few miles east of Mentone.

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5. THE IRON-AGE PEOPLE.

Iron-age pottery on neolithic sites.

In spite of the great ease with which iron objects of all kinds are utterly destroyed and lost by oxidation when exposed to damp, yet from the very durable character of the pottery the iron age people produced and the vast quantity of it they left, it is evident that in a very large number of cases they must have occupied the old neolithic village-sites; and the celts and other stone implements are now mixed up with the highly polished and brightly coloured sherds of the later-aged earthenware. Except in a very few cases the dull-coloured and rough-surfaced truly neolithic sherds occur but very sparingly.

Iron age not preceded by a bronze age. Non-seafaring inclination of the neolithic people.

That the iron age in peninsular India was not preceded by a bronze age, as in Crete, Greece and so many other Western countries, was very probably due to the land-loving character of the neolithic people, for, had they possessed any seafaring inclinations, they would certainly have sailed across the Bay of Bengal, reached the Tenasserim coast and there become acquainted with the tinstone (cassiterite) of that region. As copper is found plentifully in India, the art of making an alloy must soon

have followed. As it fell out, however, the discovery of the alloy was not made in India till after the art of iron smelting had been acquired, and iron weapons and tools had come largely into use.

The people who could make such high class pottery as much of that described in the foregoing section of my notes and figured in some of my plates, notably, plates 24 to 28 (*a*), also plates 30, 34, 36, 38, 39, 53, 55, 56 and 59, must have attained a considerable degree of civilization. Of the same age apparently are the shell bangles which occur so numerously in several sites and are many of them objects of beauty, as will be seen on reference to plates 41, 42 and 43. Shell bangles.

Shell bangles used to be manufactured at Dacca; and for the sake of comparison I procured a good series from there through a friend acquainted with the industry and found that all the patterns differed much from my series.

Owing to the avoidance of painting on their vases any representations of human figures, as was so admirably done by the Greek vase painters, there have come down to the present day but extremely few illustrations of the personal appearance of the early iron age people and of their costumes, which is much to be regretted. The few broken fragments of figurines met with afford no information whatever on this matter. The little headless figure carved in slate (No. 1541), which is figured in plate 16, even if it belongs to the early iron age, only shows that somebody wore a long petticoat hiding his or her feet. I found this little figure at a poor little village called Anguru close to the right bank of the Tungabhadra, west of Huvinahadagalli in the west of the Bellary district. The fracture above the waist looked rather fresh; so I hoped I might get the head, and offered a large reward for it, and nearly a hundred people went about searching for a whole afternoon, but failed to find it much to my regret and theirs also. No paintings of human figures on pottery.

India was not the only country in which a bronze age did not precede the iron age, for, according to J. E. Wocel, the Slavonic peoples missed the bronze age and passed straight on from the neolithic age to the smelting of iron. China is also said not to have known a bronze age. No bronze age among the Slavonic peoples.

Professor Gowland, F.R.S., the great metallurgist and the successful explorer archæologically of the Japanese islands, has expressed the idea that the smelting of iron may have been hit upon by accident while experiments were being made. This lucky accident may well have happened in India, where the iron industry is one of great antiquity (far greater indeed than in Europe, *e.g.*, at Hallstatt or La Tène) and iron ores occur so largely. Professor Gowland on iron smelting.

Civilization in the Deccan in Rama's time.

The state of civilization in the Deccan described by Valmiki in his account in the Ramayana of the wanderings of Rama during his banishment from Ayodhya must have been of much more recent age than that which can be assigned to the early iron age, in which the people appear to have been unacquainted with the other metals such as copper, gold and silver, lead and antimony: for these were evidently well known to Rama's contemporaries. The different kingdoms named by the poet seem to have been located northward of the southern boundary of the great Deccan trap area; for to the southward of that there remain no longer any ruins of great and wealthy cities of great antiquity.

The site of the Dandakaranya forest might be assigned to the tract of country lying between 17° and 15° north latitude and including the spurs of the Western and Eastern Ghats which in those early days were probably covered with far greater forests than they are now. The Rev. Thomas Foulkes, a very competent Sanskrit scholar, in his paper on the early civilization of the Deccan in the 'Indian Antiquary[1]', thought that many topographical inaccuracies must be regarded as mere poetic license.

Selected Stones.

Their Provenance.

By the term selected stones are meant stones foreign to the locality in which they were found and which were brought there intentionally by human agency to be utilized in the preparation of some special implements. In many cases these selected stones were procured in some way or other from far distant places, and getting them must have involved considerable labour and travel on the part of the neolithic people and often no little danger, if they had to pass into and through the territories of unfriendly tribes with whom no system of barter existed.

The principal stones in the list of the selected ones judging by the specimens found are the following:—

Chert.—Derived from Chert veins in the limestones of the Cuddapah and Kurnool systems and of frequent occurrence in the districts giving their names to the two geological systems in question. Veins of chert are found at Khamba and in Nigala Tappa, Kathiawar.

Agate.—Obtained chiefly from the gravels in the alluvia of rivers rising in the Deccan Trap area, *e.g.*, the Kistna and many of its tributaries, also on the Phouda Ghat in South Canara.

Jasper.—Occurs largely in some of the great hæmatite beds of the Dharwar system which is so greatly developed in the

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[1] Vol. VIII, 1879.

hill ranges which run through great part of Western Mysore and the western part of Bellary district and on into the Dharwar district and the south-western part of the Hyderabad State till covered up by the overlying greatly younger Deccan trap.

The Sandur hills, south-west of the Bellary town, which form one of the hill ranges referred to above, supply the best specimens of jasper, and the red variety of it was for some reason or other by far the most commonly used.

Chalcedony, of which the best flake knives and pygmy implements are made, was curiously enough not met with by me as a selected stone, probably because so much valued that it was immediately used up and not left lying about like the more common chert and agate.

Under the head of selected stones might be included the materials frequently brought from distant places for the manufacture of corn-crushers, mealing stones and hammer stones of various types. They include pistacite granite, chrome granite, crystalline limestone, and varieties of trap. Their general great size and weight precluded their being brought into the collection, although many are quite handsome or remarkable for size. To the latter category belongs one specimen which I did collect, however, because of its remarkable shape which fitted it capitally for conversion into a celt of very extra dimensions, far larger than the largest I have figured (No. 463 in Plate 61). This specimen was found by me in the old neolithic site of Velpumadugu in Anantapur district and it bears No. 2040–34. It must have been fetched from a dioritic dyke some six miles to the north. See page 100.

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6. CASTELLATED HILLS IN THE DECCAN.

Every one of the fortified hills in the Deccan had doubtless its chief, or king, answering to the Basileus of the old Greek fastnesses, *e.g.*, the Athenian Acropolis, the Acrocorinthus, Mycenæ, the Larissa of Argos, Tiryns and Palamidhi (the "Gibraltar of Greece" of Tozer).

Linchets.

The Deccan hill forts all rise abruptly out of the plain and command the cultivable tract around their foot, which in most cases is a black soil flat. On the larger hills the inhabitants had room for their habitations on the less steep parts of the slopes, where there were frequently spaces free from rock on which they could conveniently build their houses. These spaces or terraces which are real linchets are often held up at their lower extremities by revetments of rough stones. They vary much in size, but are mostly small and frequently near the summit.

Rock shelters.

Many of the hills are naturally castellated, the granite rocks being conveniently jointed by great vertical and by approximately horizontal joint planes which have caused the hills to be weathered into their characteristic shapes. This natural castellation of the hills was taken advantage of by the old stone-folk in many cases and improved upon here and there by the building of rough walls to stop passages which were inconvenient to the dwellers on the hills. These systems of vertical or very highly inclined joint fissures have in many places led to the formation of large and small rock shelters which must have afforded the hill dwellers great protection against both sun and rain. Many of these will have to be referred to further on as they were often utilized by the old stone-folk and their descendants. Even at the present day they are frequently resorted to by goat-herds and cattle-herds who shelter in them during the heat of the day and from storms. I have often myself sheltered in them in the heat of the day. They are often occupied by sanyasis and fakirs who frequently block up parts of the openings with rude walls.

The size of the settlements on the hills depended largely on the facilities of water-supply, for in nearly every case the residents on the hill depended on the amount of rain that could be collected and stored on the hill itself. The nature of the rocks was not suitable for the construction of wells.

No circuit walls.

In no case did I observe the castellated hills to be surrounded with circuit walls near their base, but they may very likely have been enclosed by a thick hedge of thorny character, a true zareba. Very few cases were met with in which neolithic remains were found unconnected with the hill forts. Another remarkable fact is that the stone-folk devoted their attention almost exclusively to the granite hills. I cannot recall a case in which I found traces of either the palæolithic or neolithic peoples on hills of schistose structure, such as many of the hills in the Dharwar, Cuddapah or Kurnool geological areas. They could not have been fortified except by extensive and costly walls, and they offered no advantages over the granite hills in the catchment and storage of water; indeed, for the latter purpose they were far less fitted.

Cisterns.

In some cases the disposition of the summit blocks gave rise to the formation of small but valuable cisterns which would hold rain water in some quantity in very sheltered positions. An excellent example of this is yet to be seen on the summit of the Fort hill at Bellary. These, which did not dry up by mere evaporation between the rains of the two monsoons, were beyond the reach of the enemies' arrows. On many of the hills small tanks had been constructed in convenient corners.

As already observed no positively determinable remains of neolithic houses were found in any of the neolithic sites; from which fact one may safely infer that they were constructed of materials not sufficiently durable to have remained standing to the present day. Earthenware roofing tiles do not appear to have been made; though possibly they may also have been deliberately destroyed by later residents on the hill; yet I never found the fragments of these even where other sherds lay about by the thousand. **Houses not durably constructed.**

Thatch seems to have been the only style of roofing known to the old peoples, whether of the neolithic or iron age.

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7. PREHISTORIC POTTERY.

The first appearance of vessels and other objects made of earthenware occurs in the neolithic age, no trace of them having, in India, as yet been found in any connection with the remains of the earliest representatives of mankind known, the palæolithic folk.

Although so much earthenware was found by myself and others in many different localities and so obviously of different ages, yet not a single place was met with where the making of vessels had been carried on on a scale sufficient to have left unmistakeable traces of such manufacture. Such working sites must have existed here and there, and it is rather remarkable that none were come across in a recognizable condition, when one considers how many important finds of pottery were made. The finding of such ceramic factory sites might have thrown material light on the age of the introduction of the potter's wheel, and also on the nature of the minor tools used by the workmen, which must have been rather varied to produce the many decorative designs they went in for. It may possibly have been that kilns were not known so early.[1] **No old pottery sites met with.**

It is a misfortune for Prehistoric and Protohistoric Archæology that in South India no ancient city has been found, the ruins of which reveal a succession of ages of building and habitation such as shown by Schliemann's excavations in Troy on the hill of Hissarlik.[2] Did such a site exist, nearly all the difficulties now felt in determining the relative ages of the pottery sherds so largely met with in scattered sites would vanish; but in the absence of such a guide, the collector can but grope about very painfully in his efforts to settle questions of priority many of which cannot at present be determined. Guesses at truth may be made, but **No ancient city known showing the succession.**

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[1] See Addendum No. XXI.

[2] And still more by Dr. W. Dörpfeld's extended and more systematic researches at the same place after Schliemann's death, for they proved beyond doubt the existence of a city of Mycenæan age, which was Homer's Troy.

a feeling of certainty is unattainable and it is impossible to recognise any safe sub-divisions of the several ages.

Types of pottery.

The types of pottery produced may be classified primarily as plain and decorated according to their general surfaces irrespective of shape and colour. In the plain group we see four sub-groups: *a.* rough, *b.* smooth, *c.* polished, *d.* painted. The sub-groups of the decorated group are three in number and may be described as: *a.* impressed, *b.* moulded, *c.* incised—of which the third is much the least common, though the two former were not so simple and easy to produce.

Classification by form, though quite possible, would be much less easy of accomplishment and the division into wheel-made and hand-made is not decisive enough to be always applicable. Classification by actual colour of the ware would also be difficult to carry out, as the colour varies indefinitely not only because of the differences of the clays employed locally, but also from the extent to which the potter may have fired his fabrics.

No paintings of human figures on vessels.

Two most remarkable features of the decoration of the antique pottery of Southern and Western India, so far as it has come under my ken, are the entire absence on the vases and other vessels of any delineation of the human figure and the extreme rarity of human figurines. Animal figurines which appear to have been votive offerings are also very uncommon, and in almost every case, of the rudest and most ill-shapen form, rendering it often quite problematic what animal was meant to be represented.

Nilgiri pottery.

An important exception to this observation must be noted which occurred among the tribe once resident on the Nilgiris who prepared the many earthenware figures found by the late Mr. J. W. Breeks, M.C.S., when he opened so many old cairns on the plateau, which were described by him in his great work entitled "Account of the Primitive Tribes and Monuments of the Nilgiris"; of these figurines many were photographed for the present author's "Catalogue of the Prehistoric Antiquities in the Madras Museum" published in 1901. With the human figurines were also a considerable number of animal ones all equally grotesque and some purely ideal inventions of the artists. Some represented the animals living on the plateau. Among them were no figures of any kind of fish which may mean that none occurred in the hill streams in those days or that fish were tabooed to the residents of that time.

Broken pottery in graves.

Mr. Breeks mentions that in some of the graves he opened on the Nilgiri plateau great quantities of the pottery made by the old people had been shovelled into the grave or piled round it before the completion of the small tumulus covering it in. This custom clearly agrees with one followed by the ancient Greeks (and

referred to by the late Dr. S. Birch in his great work "The History of Ancient Pottery"), who broke the vases employed in the ceremonies of the funeral rites and subsequently gathered them up and deposited them in the graves, as they had been quasi-sanctified by the rites they had been connected with and could not therefore be allowed to be desecrated by lying about.

Leaf patterns.

Very few positive representations of any natural objects are met with on any of the vessels found in the old sites in the Deccan. Of the few unmistakeable leaf patterns I met with, I have given figures of the two best on Plates 28 (*a*) and 29 of the present work. Whether some of the pinnate and bipinnate impressions on painted fillets in certain other vessels were intended actually to represent fern fronds or leaves like those of *Emblica officinalis*, the "Nellikai" of the Tamil people, it is hard to say, the representations being rather too rude. Very noteworthy as a good moulded imitation of a fruit is the side of a large melon bowl, No. 2783-100, decorated with a fillet of raspberries outside below the lip. This imitation of a fruit is well shown in Plate 59, though the sherd had suffered much from weathering. The bowl when entire must have been a distinctly handsome vessel. I found it at Maski, an old site in the Raichur Doab, with many other objects of interest, apparently all of early iron age or very late neolithic.

Melon bowl with fillet of raspberries.

Of later date than any of the above is a fine large chatty now in my possession which was found on the east side of the great mounds at Gudivāda in the Kistna district and was disinterred by the finder, my friend the late Rev. A. E. Goodman of the Church Mission Society, with my assistance. Besides other decoration, this great vessel, which was probably a grain store, shows a broad band of floral decoration of bold pattern between two fillets of pinnate impressions. The pot was hand-made. I am having it built up and hope to figure it in a future number of the Museum Bulletins.

Great florally decorated vessel, Gudivada.

The further special consideration of the many sets of antique pottery met with must be deferred, till when dealing with the several districts or states they occurred in.

A complete list of the pottery finds in the collection shows that they were acquired from 116 different localities some of which yielded but single specimens and others sets of various size ranging from two or three to 159 pieces.

The mere numerical size of a set is not in every case an absolute proof of its relative importance in the general ceramic group, for several of the very small sets are of far greater interest.

The following table is an attempt to assign the more important sets of pottery to approximately true positions in the ages into which post-palæolithic time may be divided.

Tentative age fixtures of pottery finds.

Neolithic.	Overlap of stone and iron ages.	Iron age.	Protohistoric.	Undetermined.
Sawyerpuram, Tinnevelly	Bellary North Hill, Bellary.	Scotforth Estate, Shevaroy Hills, Salem district.	Gudivada, Kistna	Valimukkam, Ramnad.
Castle Cor estate, Shevaroy Hills, Salem.	Bellary Fort Hill, Bellary.	Narsipur Sungam. Mysore	Old Patan, Baroda	Tirulacherru, Hyderabad.
Srinivaspur, east of tank, Mysore State.		Alsoor tank, Bangalore ... ... *Ibid.*	Vala, Kathiawar	Kankawao, Jetpur State, Kathiawar.
Kaldurga Hill ... ... *Ibid.*				
Somnathpur temple, west of ... *Ibid.*		Lakshampura Ford of Cauvery... *Ibid.*	Kijria Tappa, Amreli taluq. *Ibid.*	Dhalkania Dhari, T. Baroda, ... *Ibid.*
Bellary Station, Bellary		French Rocks ... ... *Ibid.*		Nagalur, Shevaroy Hills, Salem.
Kupgal Hill ... ... *Ibid.*				
Kudatanni ... ... *Ibid.*		Holakal Hill, Sira taluq ... *Ibid.*		
Budikanama ... ... *Ibid.*		Madadkerre ... . .. *Ibid.*		
Gadiganuru ... ... *Ibid.*		Banvali Graves-Chennapatna taluq *Ibid.*		
Kakballa Hill ... ... *Ibid.*		Talya Grave, Holalkere taluq ... *Ibid.*		
Halakundi cinder camp ... ... *Ibid.*		Bangalore Racecourse ... ... *Ibid.*		
Sanavasapuram cinder camp ... *Ibid.*		Kotigehar smelting works, Mudgeré. ... ... *Ibid.*		
Halekoté, south hill ... ... *Ibid.*		Kupgal, Bellary taluq, Bellary		
Hospet Hill, Alur taluq ... ... *Ibid.*		Kudatanni do. ... ... *Ibid.*		
Adoni Hill, west of ... ... *Ibid.*		Gadiganuru, Hospet taluq ... *Ibid.*		
Bellagoduhal ... ... *Ibid.*		Kakballa Hill do. ... *Ibid.*		
Nagaladinni, Adoni taluq ... *Ibid.*		Sangankallu, Bellary taluq ... *Ibid.*		
Sandavallam, Bellary taluq ... *Ibid.*		Gurzala, Adoni taluq ... ... *Ibid.*		
Huchangidurga, Harpanahalli ... *Ibid.*		Pete Tower lock, Adoni taluq ... *Ibid.*		
Kanchekeri do. ... *Ibid.*		Halwy Hill (South) do. ... *Ibid.*		
Anguru, Huvinahadagalli taluq. *Ibid.*		Anguru, Huvinahadagalli taluq ... *Ibid.*		
Talhalli, north-west of Kudligi taluq. *Ibid.*				
Malyam, Rayadrug taluq ... *Ibid.*		Malyam, Rayadrug taluq ... *Ibid.*		
Bellaguppa do. ... ... *Ibid.*		Vajrakaruru, Gooty taluk, Anantapur		
Budihal Hill, Gooty taluq Anantapur		Tadpatri temple, site east of ... *Ibid.*		
		Bogasamudram, Tadpatri taluq. *Ibid.*		
		Havaligi Hill, site north of Gooty taluq ... ... *Ibid.*		

Karakumukkalla, Gooty taluq ... *Ibid.*
Guntakal Junction ... ... *Ibid.*
Havaligi hill, Gooty taluq ... *Ibid.*
Tadpatri, 7 miles north of ... *Ibid.*
Kalamedevur, Anantapur taluq. *Ibid.*
Ghattu, Madanapalle. taluq, Cuddapah.
3 Kairupalle Hill, Pattikonda taluq, Kurnool.
Kairupalle Hill, N. W. of Pattikonda ... ... *Ibid.*
Yenguldodi Hill, Pattikonda taluq. *Ibid.*
Paspalla, Banganapalle State ... *Ibid.*

Bellumur Rayan Gudda, Hyderabad 6 miles N. W., of Ling Sugur.
Wuttugalla, Raichur taluq ... *Ibid.*
Naulukal do. ... *Ibid.*
Anandagal do. ... *Ibid.*
Rawalkonda, Sindunur taluq ... *Ibid.*
Gobur Kallu do. ... *Ibid.*
76° 5 E., Ling Sugur taluq, left bank of Tungabhadra 3 sites... *Ibid.*

Wadeli, Sankheda taluq Baroda.
Vyara, Waghoria taluq ... *Ibid.*
Karachla, Sauli taluq ... ... *Ibid.*
Kujadpura Loess Hill 11 miles E. of Ahmedabad ... ... *Ibid.*
Barria, right bank. Watrak river. *Ibid*
Dungarva Loess Hill ... ... *Ibid.*
Old Patan ruins ... ... *Ibid.*
Amroli Tappa, Sankheda taluq .. *Ibid.*

Ambaldi Hill, Amreli taluq. Kathiawar.

Kankawao, Jetpur State. Kathiawar.

Sompur Doab, Kalat State, Baluchistan

Yellatur, Cuddapah taluq. Cuddapah.
Bastipad, Ramalakot taluq. Kurnool.
Pattikonda, W. of Munro Tope ... *Ibid.*
Do. Fort Hill ... ... *Ibid.*
Rangapuram, Ramallakot taluq. *Ibid.*
Kairupalle Hill, Pattikonda, taluq. *Ibid.*
Patpad Cache, Banganapalli State. *Ibid.*
Do. E. of the Cache ... *Ibid.*
Billasurgam Caves, Nandyal taluq. *Ibid.*

Naulukal, Raichur taluq. Hyderabad.
Maski, Mudgal taluq ... ... *Ibid.*
Site 76° 5 E, left bank of Tungabhadra *Ibid.*
Copper mines, S.W. of Muktiala, Kistna valley. *Ibid.*

Sigam Sankheda taluq. Baroda.
Kamrej Town and Taluq ... *Ibid.*
Lawad Ford, Meshwa river ... *Ibid.*
Lakuji Muwara, Meshwa river ... *Ibid.*
Mahuri, right bank of Sabarmati river. *Ibid*
Banpura Gully do. ... ... *Ibid.*
Vasravi Slag Mounds, Velachha taluq ... ... *Ibid.*
Sandhur Slag mounds, Sankhedu taluq ... ... *Ibid.*

Machiala Nana, Amreli taluq. Kathiawar
Damnagar, Town and Taluq .. *Ibid.*
Do. south of ... ... *Ibid.*
Rupavati, Damnagar taluq ... *Ibid.*
Babapoor, S. of Amreli taluq ... *Ibid.*
Samadhiala ... ... *Ibid.*
Umria Maidan ... ... *Ibid.*
Lowarali, Dwarka taluq ... *Ibid.*

Ceramics referable to four ages. Four such ages seem recognizable: the neolithic, the overlap of the stone and iron ages, the iron age proper, and the protohistoric age. This assignment to determined position of the different sets of antique pottery is of necessity only a quite tentative proceeding, for there is under present circumstances no absolute certainty for judging the age of the pottery by mere collocation with neolithic implements which does not in many cases prove the actual neolithic origin of the vessels or sherds remaining. The facies of the typical neolithic pottery will, I believe, turn out to be dull-coloured and rough-surfaced with but little decoration, whereas the true iron age vessel is distinguished by showing rich colours and highly polished surfaces with, in some cases, elaborate and artistic mouldings. There had been a true evolution in the potter's art which then attained a stage of very real beauty. This was probably before the great Aryan invasion, under which the potter's craft came to be despised and neglected, as it is nowadays to a very great extent, as evidenced by the great plainness and often absolute ugliness of the present day pottery.

Old Buddhist pottery. The pottery of the protohistoric early Buddhist times as found on the great mounds at Gudivāda, in the Kistna District, shows many changes from the typical iron age finds of Narsipur Sungam and West Hill (French Rocks) in Mysore, Malyam in Bellary and Patpad in Kurnool district. Some of the more modern forms now met with approximate much more to the present day shapes, *e.g.*, the so-called "Gujas" or water bottles. A special type of bowl shows concentric undulation of the sides often highly polished and light red or brown in colour. A third very characteristic type is a black highly polished ware showing a generally flat base, but undulated with many low rings around a moderate-sized median cone or pap, a true mesomphalus. Of the half dozen examples of this type I collected, none was sufficiently unbroken to show the shape of the sides and mouth of vessel. To this Gudivāda series belongs the great "grain store" chatty with floral decorations above referred to (*ante* p. 31).

Hut-urns. A special branch of earthenware industry deserving separate notice is the manufacture of hut-urns for funereal purposes. Though only one fragment of such a hut-urn is included in the collection, the subject is one of great interest and calls for some consideration.

The one fragment demanding attention, No. 2783–86, which I found at Maski in the Raichur Doab, Hyderābād State, is the right jamb of the door of a small hut-urn, the prototype of the hut-urns now met with in various parts of the country, some of which show remarkable resemblance to the same objects

of western classical antiquity, such as were found under the volcanic tufa near the Alban lakes, to the south of Rome. They were in some cases filled with the ashes of the dead, after cremation, which were introduced by a little front door. The door was secured in place by means of a rope passing through two rings at its sides and tied round it. The whole resembled in shape a cottage with vaulted roof. Two forms of such earliest Etruscan art hut-urns are figured in Dr. Samuel Birch's "History of Ancient Pottery", and they very strongly resemble modern forms, such as those occurring at Harsani in the Velachha taluq of Baroda state, and a large group of very fine ones near the great ford over the Tapti, some miles east of Mandvi in the Surat district. The Maski hut-urn is figured in Plate 37.

I specially noticed the arrangement for closing the door of one urn at Harsani. The little door of the hut had no hinges, but was kept closed by two rude bolts working through flattish rings, on either side of the door, into a wider ring in the centre of it.

A very small but typical hut-urn that I passed one evening in the fields, a couple of miles or so to the east of Salem, was in use as a shrine of some *swami* who would in consideration of a lamp burning to his or her honour, take care of the crops growing in front. The little hut-urn itself looked very worn and weather-beaten, whereas the Gujarati examples were in prime condition. Hut-urn shrine.

One in the British Museum, presented by Mr. W. R. Hamilton, is filled with the ashes of the dead, which were introduced by a little door. This door was secured by a cord passing through two rings at its sides and tied round the vase. The cover or roof is vaulted and apparently intended to represent the beams of a house or cottage. The exterior had been ornamented with a meander of white paint, traces of which remain. The ashes were placed inside a large, two handled vase which protected them from the superincumbent mass. They have no glaze upon their surface but a polish produced by friction. *See* Addendum No. XIX.

Attention will be drawn specially to the interesting specimens of the several series, when they come to be treated in their true geographical positions and many will be found figured in the plates which ornament this book.

A very peculiar type of pottery known as Celadon ware which is met with largely from Karachi to Babylon and from China to Arabia, appears only to have reached Makran long after the emigration of the Brahuis that reached Southern India. This ware which is invariably of pale sage green shows in some cases remarkable fineness and great beauty of glaze. Personally I have never come across this ware in Southern or Western India. Celadon ware.

Had it been brought down by the Brahui Dravidians in their migration, it is extremely unlikely that fragments of it should not have been seen by me, in any of the scores of neolithic sites I examined, in the South and West. In Afghanistan it is believed to have the virtue of revealing the existence of poison by cracking in its presence. It had the general character of being a lucky possession.

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7. DISTRIBUTION OF THE PREHISTORIC PEOPLES.

Palæolithic man avoided great forests.

A consideration of the map of prehistoric localities which accompanies this work shows that the several peoples concerned were widely distributed over the country, excepting in the mountain and great forest regions of the west of the peninsula, in which, so far as my experience goes, no traces have been found of the palæolithic race, or races. The localization of all the races has also been influenced in some measure by the distribution of the rocks yielding materials suitable for their respective implements. Thus, there are far more numerous traces of the palæolithic race around the great quartzite yielding groups of hills forming the Cuddapah series of the Indian geologists and the great quartzite shingle conglomerates of the Upper Gondwana system in the Chingleput (Madras), North Arcot and Nellore districts, than in other regions. In diminishing quantities traces of palæolithic man are found to the northward of the Kistna valley, where quartzite becomes a much less common rock. So also to the southward of the Pálár valley, where quartzite becomes a rare material; to the westward on the Deccan plateau, where the stone chippers finding no quartzite in the Bellary district had recourse to the banded jasper hæmatite rocks (of the Dharwar system); and further north in the valley of the Kistna, where recourse was had in one instance to hard siliceous limestone.

The extreme rarity of trap dykes in the south of the peninsula may have been a *vera causa* of the rarity of neolithic remains in the regions south of the Cauvery, while it is certain that in the northern parts of the Deccan plateau, where neolithic remains most abound, dykes of basaltic, dioritic and diabasic traps are very plentifully distributed. This has reference to their war implements, as their axes are, as a rule, almost without a single exception, made of the trappoid rocks and especially of the finer grained varieties of these.

Among the many hundreds of celts I collected on the Deccan plateau only one example was made of gneiss and that was found in the cinder camp at Lingadahalli in Bellary district. The only other celt not made of trappoid rock that I know of, is

one, now in my collection, which was found in Malabar at the foot of the Kanyakod mountain by my friend and colleague Mr. Philip Lake, M.A., Cantab., when geologically surveying the northern side of the Palghat pass. It is made of pale pink granulite. He very kindly presented it to me. It is figured as No. 89 in Plate 3.

Domestic implements of various stones.

For the ordinary forms of domestic implements, such as mealing stones, corncrushers, hammerstones, flakers, etc., the neolithic people used a great variety of stones as granite, green (chrome) gneiss, pistacite granite, banded hæmatite jasper and jasper breccia, conglomerates and grits of both the Dharwar and Upper Gondwana systems, hornblendic trappoid, agate and chert. Quartzite, the great stand-by of the palæolithic people, is almost unknown among neolithic artifacts, unless possibly a few flakes and scrapers of that material may belong to the second stone period, though they were left unpolished for some reason or other. The unworked edge of a quartzite scraper would probably have been a more effective tool for scraping with than a polished one would have proved.

Much additional knowledge regarding the palæolithic peoples and their appearance on earth and their distribution in Western and Central Europe, has been obtained of late and requires notice, though unfortunately no further light has been gained on the Indian palæolithic peoples, which allows of any assignment of sequence, in time, to any one set of them subsequent to the makers of the implements found low down in the alluvium of the Sabarmati, who certainly seem to have been the earliest men to appear in what is now India. They must have lived near the headwaters of the river, for the implements show that they had been rolled a very considerable distance, and the gritty quartzites of which they were made were doubtless derived from the Aravalli hills or their southern extensions.

Fossil bones rare in the Desang alluvium.

A remarkable fact which must be noted is the extraordinary rarity of bones in the Sabarmati and Desang alluvia by which to attempt any determination of the age of the lower members of that alluvium. I had not myself the good fortune to find any determinable bones and the only recognizable mammalian object I got sight of was part of a molar of an elephant, but of what species I could not find out, for it was esteemed a valuable possession by the priest to whom it belonged and who refused to let me buy it and was very angry when he found that I had tried to cleanse off the very thick coating of red lead and oil with which it had been covered and which prevented it being specifically identified. I had to return it immediately.

Between the position of the Sadolia palæoliths and the loess beds on the top of which were met the neolithic objects which occur in Gujarat, lies, as shown in the diagram facing page 15, a thickness of 50 feet of the upper alluvium of the Sabarmati capped by from 100 to 200 feet of loess to be seen in other sections lying north and south of this one in which no traces of human residence showed themselves. The period necessary for the accumulation of these deposits may therefore be not unreasonably regarded as an important hiatus in time which it may not be possible to bridge over by the finding of examples of prehistoric man's handiwork in adjoining regions.

From our present knowledge, we cannot correlate the Sabarmati alluvium with the palæolith-bearing lateritic deposits of the East Coast and of the Deccan, which, as far as I have been able to interpret them, do not allow of any sub-divisions of importance being recognized.

Trace of Magdalenian civilization.

A possible exception to the above conclusion may be established by recognizing the occurrence of a trace of a Magdalenian settlement in the Billa Surgam cave in Kurnool district. This trace consists of a very few carved bones and teeth which were found by my son Lieut. (now Lieutenant-Colonel) H. B. Foote, R.A., when he took my place and completed the exploration of the bone cave in 1884. These got accidentally mislaid for several years and have yet to be described and figured in the Records of the Geological Survey of India. It was only quite lately that their Magdalenian character struck me, when I looked at them after finding the missing box.

Much light has been thrown by Colonel Sir Thomas Holdich, K.C.M.G., on the immigration into India of the Dravidian people by the Makran Coast Gate in his admirable book, "The Gates of India", in which he points out :—

Dravidian immigration into India by the Makran Coast Gate.

"In the illimitable past it was by this way that the Dravidian peoples flocked down from Asiatic highlands to the borderland of India. Some of them remained for centuries either on the coast-line, where they built strange dwellings and buried each other in earthen pots, or they were entangled in the mass of frontier hills which back the solid Kirthar ridge, and stayed there till a Turco-Mongol race, the Brahuis (or Barohis, *i.e.*, 'the men of the hills'), overlaid them, and intermixing with them preserved the Dravidian language, but lost the Dravidian characteristics." (p. 142.)

"Here are a people who have been an ethnological puzzle for many years, talking the language of Southern Indian tribes, but protesting that they are Mongols. Like the degenerate descendants of the Greeks in the extreme north-west, or like the mixed

Arab peoples of the Makran coast and Baluchistan, these half-bred Mongols have preserved the traditions of their fathers and adopted the tongue of their mothers. It is strange how soon a language may be lost that is not preserved by the women! What we learn from the Brahuis is that a Dravidian race must once have been where they are now, and this supports the theory now generally admitted, that the Dravidian peoples of India entered India by these western gateways." (pp. 142-3.)

"No more interesting ethnographical inquiry could be found in relation to the people of India than how these races, having got thus far on their way, ever succeeded in getting to the south of the peninsula. It could only have been the earliest arrivals on the frontier who passed on. Later arrivals from Western Persia (amongst whom we may reckon the Medes or Meds) remained in the Indus valley. The bar to frontier progress lies in the desert which stretches east of the Indus from the coast to the land of the five rivers. This is indeed India's second line of defence, and it covers a large extent of her frontier. Conquerors of the lower Indus valley have been obliged to follow up the Indus to the Punjab before striking eastwards for the great cities of the plains. Thus it is not only the Indus, but the desert behind it, which has barred the progress of immigration and conquest from time immemorial, and it is this, combined with the command given by the sea, which differentiates these southern gates of India from the northern, which lead on by open roads to Lahore, Delhi, and the heart of India." (p. 143.)

"The answer to the problem of immigration is probably simple. There was a time when the great rivers of India did not follow their courses as they do now. This was most recently the case as regards the Indus and the rivers of Central India. In the days when there was no Indus delta and the Indus emptied itself into the great sandy depression of the Rann of Katch, another great lost river from the north-east, the Saraswati, fed the Indus, and between them the desert area was immensely reduced if it did not altogether disappear. Then, possibly, could the cairn-erecting stone-monument building Dravidian sneak his way along the west coast within sight of the sea, and there indeed has he left his monuments behind him. Otherwise the Dravidian element of Central Southern India could only have been gathered from beyond the seas; a proposition which it is difficult to believe. However, never since the desert strip was formed which now flanks the Indus to the east can there have been a right-of-way to the heart of India by the gateways of the west." (p. 144.)

These soi-disant Mongols or "Mingals" seem to have been a very wild truculent tribe.

Route of the Dravidian immigrants.

How far the Dravidians may have followed their south-easterly march along the seaboard before diverging inland is a question to be settled when the prehistoric archæology of western India has been far more completely worked out; for, as will be seen from my map, a broad belt of country between Lat. 18° N. and Lat. 21° N. was not examined by myself, or, so far as I know, by any other archæologist whose work has been published. Another point of immense interest that requires determination is whether the migrating Dravidians had attained the semi-civilized stage of the polished stone age, or whether they were still semi-savages who had not advanced beyond the art of making palæoliths or mere chipped implements. Evidence on this point is wanting and should be sought for on the Makran coast, because it is full of Turanian relics connecting it with the Dravidian races of the south; but there is no time now to follow these interesting glimpses of prehistoric ethnography opened up by the log of Nearkhos, from which, however, one very interesting extract was given before (page 13) illustrating the low state of civilization of one of the coast tribes he encountered.

The route the immigrants followed has to be traced as yet, and the theory that they stuck to the coast seems to me to be untenable; for they would have had great difficulty in crossing the gulfs of Cutch and Cambay, unless they had vessels of some size at command, which was very unlikely. Had they kept to the sea-coast, they would assuredly have left some traces of their passage which would have remained to the present day; but in passing along near the coast between Diu and Veeraval and Por Bundar and Bet Head, the extreme north-west point of Kathiawar, and in closely surveying the whole of the Okhamandal Prant, I came across no prehistoric monuments of any sort or kind; nor did I meet with any such megalithic structures in any part of southern Kathiawar, though very keenly on the look-out for such remains wherever I travelled; nor were any implements of any kind met with in that region.

The Concan probably avoided.

It is impossible not to theorize on such a question as this, and it seems to me far more likely that the Dravidians crossed the Indus above its embouchure into the great fresh water lake, which filled the depression now known as the Rann of Cutch, kept along its northern shore, and did not trend southward till they had reached the Sabarmati valley, which they descended keeping inland from the head of the Gulf of Cambay. Following this route, they would find little material for the construction of any megalithic structures such as are attributed to them, till they got south of the Tapti valley, by which they may well have reached the

great Deccan Trap plateau, and with much greater ease than by any of the more southerly passes. Once on the plateau their route offered no very serious obstacles to reaching the Deccan proper. That they continued southward from the Tapti valley and followed the coastline of the Concan seems less probable, for, coming from the mountains of South Baluchistan, they would greatly prefer the cool dry climate of the Deccan plateau to the damp sweltering heat of the coast. Moreover, the Concan was in those days most likely densely covered by forest far thicker and more impenetrable than that growing on the trap area a few miles eastward of the crest of the Sahyadri or Western Ghats, where the rainfall has already decreased very greatly. That the immigrants, whether palæolithians or neolithians, avoided the great forest region of the Sahyadri range is, I think, an undoubtable fact; for, when surveying part of that region in the early seventies of the last century very closely, and climbing up and over a very large number of the ridges and plateaus within the forest area, I came across no prehistorics of any kind whatever, whereas as soon as I turned away from the forest into the more open country, I found both palæoliths and neoliths sporadically and in increasing numbers the further I got away eastward. (See p. 134.)

A close and careful survey of a tract about 25 square miles in area at foot of the Phonda Ghat, which I descended from Dajipur, did not yield the faintest trace of anything prehistoric, though no forest remained and the country was clear and open. I came upon no megalithic structures and found no implements of any age.

The heavy forest region I surveyed lay between Lat. 15°35 N. and Lat. 16°27 N.

The existence of heavy forest on the mountains in western Mysore, including the Kudré Mukh and Baba Boodan massifs, had brought about an identical condition of things. No prehistorics were found within the forest region, but outside of it prehistorics representing both the stone ages and the early iron age were met with pretty frequently. The extensive clearing of the heavy forest which formerly covered the Coorg plateau could not have been accomplished in neolithic times; it was impossible to have done it before the people were in possession of iron axes, and this fact gives an approximation to the age of pottery found in the caves and rock cut cells there found.

The date at which the Dravidians immigrated from south Baluchistan must be an early one, supposing that they followed the route above suggested along the northern coast of the great Rann of Cutch lake, for great changes in the physiography of the country took place subsequently. The Indus changed its course

and formed an important delta to the east of the present port of Karachi; the Rann lake dried up as the Indian desert came to pass; the great fresh water lake became very shallow and brackish and dried up during a great part of the year. From this dry surface and from the great mud-flats of the Gulf of Cambay exposed by low tides, strong westerly winds gathered the loamy sand and carried it all over the plains of Gujarat and formed the many "loess" hills which are such marked features in the landscape of many parts of the otherwise dead level country. The successors to the palæolithians have left traces of their existence on the top of many of these loess hills. As no objects of iron were met with on these hills or any traces of its having been there, it seems a fair inference that the people who left their remains and possessions on the hills were neolithians.

Type of the Indian palæoliths. Chelleo-Moustérien.

The palæoliths found in Southern and Western India, if judged by their general shape, agree best with the *Chelleo-Moustérien* type belonging to the lowest division of the palæolithic age which lies above the deposits of the preglacial period in Europe.

This sub-division is traceable from Spain through France across Switzerland and Germany and Austria into Poland and Russia near Kiev, and south-eastward into the Crimea. From the Crimea eastward it is again met with on the north of the Caucassus in the province of Kuban. The same type of palæoliths is known in Siberia at Krasnojark on the left bank of the Jenessei. Egypt has yielded palæoliths plentifully—they had been made by a people living on the plateau west of the river valley, and many of them are included in old alluvial gravels near Thebes. Palæoliths have been found in Palestine, but none appear to have been recorded from Arabia[1], the Euphrates-Tigris valley and Persia, and they have not been met with again till the Sabarmati valley in Gujarat is reached in the explorer's eastward march. In Africa to the south of Egypt, palæoliths are known in important numbers from Somaliland and from the valley of the Zambesi at the Victoria falls. Colonel H. W. Feilden found that the great gorge below the falls had been excavated by the river since the deposition of a shingle bed rich in palæoliths of chalcedony, which must therefore be of very great antiquity. The time occupied in the excavation of that mighty gorge is doubtless a great part of the hiatus between the palæolithic and neolithic eras. Colonel Feilden's conclusions strike me as being perfectly sound. There is

[2] The gorge of the Zambesi.

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[1] But neither are they known to have been looked for by experts.

[2] A very beautiful view of the gorge by E. H. Holder appeared in the Windsor Magazine for November 1909, the picture bearing the title "The Victoria Falls viewed from the Rain Forest."

no need to refer but cursorily to the palæoliths of the Cape Colony nor to those of the American continent. Those occurring in the south of England and Belgium must not be forgotten though they lie to the north of the course from France through Germany indicated above.

Homo heidelbergensis.

Old as are the *Chelleo-Moustérien* deposits, remains of man have lately been discovered in Germany in what must be reckoned a deposit of far greater antiquity. This discovery of a human lower jaw was made very near to Heidelberg and is recorded by Dr. Otto Schoetensack. This most interesting and important relic described as *Homo heidelbergensis* was found in an undisturbed bed of sand at the depth of 78 feet below the surface. This sand deposit is shown by the fossil bones found associated with the jaw to be of the age of the Cromer Forest bed, the bones being remains of *Elephas antiquus*, *Rhinoceros etruscus*, Falc., and *Equus stenonis*, Cocchi, all well established forms.

Skeletons found in French caves.

Two other important finds of human skeletons of diluvial age are reported from France, one in the lower grotto of Le Moustier (Dordogne), the other at La Chapelle-aux-Saints (Corrèze). These are quoted by Dr. Haddon, who gives various particulars about them in an admirable paper in "Nature" (July 29, 1909).

To lovers of prehistoric lore that are able to read German, I would strongly commend a capital book that deals very fully with this branch of learning, and from which I have gained more information than from any English or French work I had met with up to 1905. I refer to Dr. Moritz Hörnes's "Der diluviale Mensch in Europa[1]." It is much to be hoped he will soon bring out a new edition of it. His "Urgeschichte der bildenden Kunst in Europa" would also appear to be a very helpful and desirable book to possess.

The French works of de Mortillet, Cartailhac, and Reinach are *sine qua nons* to the earnest student of prehistory. The very important papers of M. Boule are unfortunately scattered in the numbers of the Revue d' Anthropologie, and this is the case also with many of those M. E. Piette, one of the most strenuous and successful of the French explorers. His writings are very largely quoted by Hörnes, to whose book I would refer all would-be students of man's prehistory.

Another valuable work in German is Professor J. Heierli's "Urgeschichte der Schweiz"[2], which gives an admirable account of the prehistory of the Mountain Centre of Western Europe from the glacial period to the protohistoric, immediately before pre-

[1] Published by Frederick Viewegund Sohn, Braunschweig, 1903.
[2] Published by Albert Müller, Zürich, 1901.

Roman times. This includes the palæolithic, neolithic, bronze and early iron ages. Each of these is dealt with fully.

In his opening chapter he gives a succinct but clear and very interesting resumé of the changes which took place during and after the glacial, interglacial and postglacial periods, and enumerates the important alterations of the faunas and floras resulting from the variations of climate.

He next discusses the causes of the ice age assumed by various writers, but accepts none. He also quotes G. deMortillet's four periods of palæolithic life and their supposed duration in years as follows :—

	YEARS.
1. Chelléen, preglacial	78,000
2. Moustérien, glacial	100,000
3. Solutréen and postglacial	11,000
4. Magdalénien	33,000
	222,000

Both the periods and their ages are based upon the data of the French sites and their yieldings.

He gives also a calculation of his own showing that the palæolithic period had at least a duration of 100,000 years. These calculations are followed by a sketch of the principal discoveries in prehistoric archæology and palæontology made in Europe from 1577 onward to the present time, in which reference is made to the labours of Platter, Scheuchzer, Gessner, Cuvier, Lamarck, Boucher de Perthes and Schmerling.

The Swiss cave which yielded such very important palæolithic finds, the Kessler loch at Thaingen, is next dealt with, as also the famous rock shelter of Schweizerbild, both in the Canton of Schaffhausen and only short distances from the town and the famous falls of the Rhine.

Drawings on reindeer horn.

He gives capital illustrations of the two famous ancient drawings on reindeer horn of the grazing "reindeer" and of a horse (or pony) found in the Thaingen cave.

The former is specially good as it shows the curvature of the engraved horn which hides the animal's feet, whereas the latter is really an unrolled drawing, the feet of the horse being shown as if the whole were on a flat surface.

One very great merit of the book is the copious way in which it is illustrated with admirably drawn figures.

Lake dwellings and pile buildings.

His account of the many lake dwellings of the several ages is a full and very interesting one, and he devotes several pages to an enumeration of the many countries in which pile buildings are in use in lakes, rivers or shallow seas. Attention is drawn to the

two bands of lake dwellings in Europe, the southern one extending from the Pyrenees along both sides of the Alps and along the Balkan mountains, the northern one stretching from Ireland across England, Holland and northern Germany into Russia.

Stone and bronze ages in Italy and Sicily.

Another work well deserving the attention of all interested in prehistoric research is Peet's "Stone and Bronze Ages in Italy and Sicily." In this well got up volume emanating from the Clarendon Press, Oxford, Mr. T. E. Peet, who is a Craven Scholar, gives a very able and interesting resumé of the exploratory work carried on by the Italian and foreign antiquaries through the length and breadth of the peninsula and in Sicily and Sardinia. The book is richly illustrated with many well executed drawings of implements of stone, bone, shell, staghorn, wood, copper and bronze, also of plans and elevations of rock and built tombs, views of dolmens and of a great variety of examples of pottery from the peninsula and the different islands and of the several ages treated of. Beside the illustrations in the text (275 in number), there are six plates with 90 figures depicting 152 objects, chiefly pottery. In addition to this wealth of illustration are four outline maps which greatly help to render the book easy of comprehension. They are: (i) Italy during the neolithic and eneolithic periods, (ii) The Po valley during the bronze age, (iii) Italy during the bronze age, and (iv) Sicily during the prehistoric periods. Mr. Peet has divided his book into XIX Chapters, of which Chapters II to VII are of the greatest importance to the student of Indian prehistoric lore, as they deal with the neolithic age. Chapters VIII, IX and X are of less interest because the eneolithic period has no corresponding period in India where the iron age preceded the advent of the copper and bronze period.

Lake-dwellings not yet known in India.

Chapters XIII and XIV on the early lake-dwellings and the *terremare* are of very great interest, though no corresponding structures have as yet been met with in India; but some habitations of a similar kind may yet be found in lagoons and estuaries which have not been exhaustively searched. My own search for traces of lake-dwellings were limited to the Covelong backwater, the Ennore backwater and the southern half of the Pulicat lake, and it led to nothing, but then, it was far from exhaustive. The time at my command was far too short and I had not a pair of light boats at command, with which to drag the water for possibly remaining piles. The more inland freshwater lagoons, such as the Colair or Kolair lake in the Kistna district, having no connection with the sea, and therefore not tenanted by Teredos, would probably be the best worth hunting.

For would-be students of the bronze age, Chapters XV, XVI and XVII will prove of extreme interest, and form an important supplement to Sir John Evans' great work on the bronze age. Chapter XVII is especially interesting, dealing as it does with the several ages found to be represented in Sicily, Sardinia and Pantelleria, but most especially with the bronze period. Of great anthropological interest is Chapter XVIII on "the Racial Problem", in which the ideas of the two great Italian archæologists Pigorini and Brizio, are reviewed. Mr. Peet favours the ideas of the former. The oldest neolithic people were the Liguri or Ibero-Liguri, who lived in either caves or huts and disposed of their dead by inhumation. They were a dolichocephalic race.

When the neolithic age was drawing close to its end, a new race of Aryan origin, who practised cremation, appeared in Northern Italy and built the first lake-dwellings in Lombardy. A second invasion of the same people took place about the middle of the bronze age, and they established themselves in the Veneto in lake-dwellings and in *terremare* in Emilia. They came not from the north, across the Alpine passes, but from the east along the valley of the Danube. At the end of the bronze age a part of this people to whom Pigorini gave the name of "*Italici*" departed from the valley of the Po, crossed the Appenines and arrived in the Sabine country from whence it descended to the left branch of the Tiber and there founded Rome.

The members of another immigration made for Etruria and spread to the district of Tarquinia. An important section of the "*Italici*" remained for good in the Veneto country.

The view propounded by Professor Brizio, which Peet does not favour, is that the Liguri at sometime still in the neolithic age turned pile-dwelling builders and later on took to constructing *terremare*—a highly improbable change; and a yet more improbable one is postulated by the supposition that they deliberately changed their burial custom of inhumation to that of cremation. Yet other difficulties which remain hard to explain away are pointed out by Mr. Peet.

One fault which does certainly detract from the otherwise great value of the book is the absence of a subject index. The full index to the place names is far from sufficient and it is much to be hoped that this great omission will be remedied in the second edition which Mr. Peet's book should certainly run to. Having greatly enjoyed the perusal of the book I can gladly recommend it to other lovers of prehistory.

C.—DISTRICTS AND STATES

IN WHICH

PREHISTORIC AND PROTOHISTORIC ANTIQUITIES WERE FOUND; ARRANGED IN GEOGRAPHICAL ORDER.

CHAPTER I.

TRAVANCORE STATE.

WHEN examining the geology of the low country of the Travancore State, south of Trivandrum (in the very early'eighties), by a fairly close series of traverses, I had not the good fortune to come across any traces of the habitation of that region by either the palæolithic or the neolithic peoples, and my friend and colleague, the late Dr. William King, who worked over the northern half of the State, had the same experience. Enquiries made of the Trivandrum Museum through Lieutenant-Colonel Dawson, Commandant of the Nair Brigade, as to the possible existence of such remains in the collection, elicited a very courteous reply from which I give the following extract: "My headman gives the following information: 'I beg to state as no explorations have hitherto been made by this Government in exhuming buried remains it has not been possible to work up this section'.

The Trivandrum Museum.

"There are four urns placed on exhibition in the museum, of which the two wide-mouthed ones are from Courtallum and the remainder one with a narrow mouth bearing impressions of coir all round the outer surface is said to have been obtained from the north of Travancore and the other from Trivandrum. These pots are distributed throughout the length and breadth of Travancore and the neighbouring districts. They are found at varying depths from 2 to 4 feet underground."

Through the kindness of Lieutenant-Colonel Dawson I obtained an excellent photo of one of these urns which shows the texture of the surface extremely well. From this remarkable texture, one is necessarily led to the inference that it was produced by covering

the damp earthenware before firing with a woven cloth, the pattern of which was impressed very evenly on the urn. Neither this pattern of surface nor this peculiar form of urn were met with by me in any other part of Southern or Western India; they appear to me therefore to be of very great interest. There seems to be no indication as to what special purpose they were made for. The vessel in question may be described as a rather tall chatty with a small mouth.

Two reasons for the absence of traces of the peoples of the two early stone ages in Travancore may be reasonably suggested—firstly, the absence in the extreme south of the peninsula of the two kinds of rocks which those peoples chose as the material out of which to manufacture their implements and weapons, namely, quartzite in the case of the palæolithic people, and varieties of basic trap in that of the neolithic people.

The second reason may well have been that man had not yet penetrated into the great and nearly impenetrable forest region which then occupied the Western Coast and the mountain region of the south.

As already mentioned the settlement of man on the heavily forested mountains was not possible till he had obtained the use of iron axes, wherewith to fell the huge trees he had to clear away, before he could accomplish agricultural work on a large scale.

The urn above described must be classed under the head of "fabric marked pottery", a capital definition in use by American ethnographers.

CHAPTER II.

TINNEVELLY DISTRICT.

No finds of positive palæolithic implements rewarded my search for prehistoric remains in this, the most southerly district of the Madras Presidency, and no evidence of any kind as to the inhabitance by the palæolithic people of the extreme south of the Indian peninsula came under my notice. No true palæoliths.

The first find I made was a small oval scraper of basalt which I found in the valley of the Tambraparni, at Saidanganallur. It had evidently been much rolled in, reaching the spot where found. It deserves attention because of the exceeding rarity of basaltic rocks to the south of the Cauvery river. I incline to regard it as a neolith. Neolithic find.

The prehistoric sites of the mixed iron and bronze age from which Mr. A. Rea of the Archæological Survey procured such a splendid series of iron and bronze objects, together with immense quantities of very varied pottery, were unknown at the time of my work in Tinnevelly district. Dr. Robert Caldwell, later on Missionary Bishop of the district, was acquainted only with some funereal "pithoi" excavated at Korkay (Kolchoi), from which he obtained skulls and other human bones. It was the only prehistoric site he mentioned to me—and I was prevented from visiting it by the exigencies of my official work and the difficulty of reaching the place from the coast along which my working route lay primarily. I only became acquainted with the Tinnevelly ancient pottery many years after by seeing it in the Madras Museum. Post-neolithic finds.

The small oval scraper above referred to which forms No. 1 of the collection, I obtained by the side of the high road leading from Palamcottah to Srivaikuntam close to the big S.E. bend of the Tambraparni river. It lay by itself without any accompaniment of antique pottery fragments.

Strangely enough I came across no traces of the very important and interesting early iron age settlements, along the lower valley of the Tambraparni, which have yielded such large and rich results during the work of the Archæological Department so successfully carried out by Mr. Rea at a later date. I must have passed within a few yards of several of the sites.

Sawyerpuram Teri section.

My discovery of the neolithic remains, Nos. 2 to 73, near Sawyerpuram was made while mapping the southern extremity of the Teri, or red sand dune, at that place. Wind action had made a broad cutting 15′ or 16′ deep through the blown sand a little distance northward of the extreme south point of the red dune, and exposed a broad surface of intensely red loam which attracted my attention, as I had never previously seen so highly ferruginous a soil. Imbedded in the red loam were fragments of chert, silicified wood and limpid quartz, all three stones foreign to that part of the country. On examination they mostly proved to be cores and flakes that must have got to that site by human agency, for they showed no signs of having been rolled. Some of the cores, which are small (all being under an inch in length), are very shapely and all were stained red by the ferruginous soil they lay in.

With them lay a solitary fragment of red pottery, No. 73*a*, marked with a unique pattern, a photo of which was to have been taken but was unfortunately overlooked. The fragment shows that it had been exposed to the action of sand blast which had worn the surface considerably and given it the style of polish peculiar to that agency.

Noteworthy in this series are Nos. 2 and 3 which may be regarded as small poly-angular slingstones identical in shape with their British representatives which are found piled up in heaps in many of the old camps ready for use against approaching enemies.

No. 43 is a "tranchet" shaped flake, possibly an arrow-head and, if so, a most interesting object. It is figured in Plate 14. A similar form made of flint is known from the old burying places in the Aveyron region of France.[1]

No short flakes such as must have been struck off the small chert cores of this series were obtained here, doubtless because they had been utilized elsewhere. No cores were found of limpid quartz corresponding to flakes Nos. 12 to 15.

It is very desirable that this remarkable old surface should be revisited and carefully gone over again as my examination of it should not be regarded as exhaustive; for weather-action may have revealed fresh specimens and possibly also have exposed still further the area of the old red loam surface. It is to be hoped that some future resident missionary at Sawyerpuram may be interested in further research, for he is sure to be rewarded

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[1] *Vide* figure 115 (p. 251) in Cartailhac's La France Préhistorique d'après les Sépultures et les Monuments. This figure shows a rather narrower form than mine and has the cutting edge turned downward instead of upward.

more or less and perhaps very richly. I did not come across similar old surfaces connected with any of the other Teris in the south, but it is quite possible that such may exist and would well reward future explorers.

The very important and intensely interesting results of the excavations carried on by the Archæological Department under Mr. Rea in many old sites in the Tambraparni valley and delta are worthy of very great attention. They reveal a rather later stage of civilization kindred to that shown in Mr. Breeks' work among the old graves of the Nilgiris.

CHAPTER III.

MADURA DISTRICT.

Palæoliths. It is in this district that remains of palæolithic men are first met with by the explorer proceeding northward from Cape Comorin. I procured a few very rude quartzite specimens from a shingle bed in the alluvium of the Vaigai on the left bank of the river immediately north of Madura town. They were unfortunately lost later on. The only palæolith found in the district, which I retained in my collection, was one I picked up at Aviyur, 12 miles south of Madura. It is made of a pebble of quartzite of which one end has been rudely chipped into a cutting edge. This is now No. 82 of the collection.

Neoliths. The number of neolithic objects found by me in this district was very small—a fact very likely due in great measure to the absence, or extreme rarity, of the favourite material which the polished stone folk preferred for the construction of their weapons and tools, namely, the hard and tough basic rocks, the basalts, diorites and diabases so largely used by their contemporaries in the Southern Deccan, Carnatic and adjacent more northerly districts in which those particular rocks occur in great abundance.

Macehead. An important neolith found by me at Vellalankulam, south of Madura, is a ringstone or macehead (No. 78) made of gneiss perforated by a well drilled but not perfectly centrical bore.

Flake saw. A second neolithic object of great interest found in the district was a flake saw, of chert, which lay in a bed of chert gravel on the banks of the Pālār (river) at Tirupatur in Sivaganga zamindari. The saw edge of the thick-backed flake is formed by seven distinct notches having been broken into the harp side of the triangular piece of brown chert. This is No. 80 of the collection and is figured in Plate 15.

Bone pendant. I came across no chert *in situ* in the district; so probably all specimens of it found must be regarded as imported stones. Another very important find was a small bone pendant which had been washed out by the submerged forest in Valimukkam bay and was rolling about in the ripple which represents the surf of the open coast. The whiteness of the exposed bone contrasting with the dark (nearly black) mud still adhering attracted my attention to the little object in the water and on washing it I found out its interesting character. It is figured in Plate 46.[1]

[1] The preservation of this piece of bone was largely due to its having been buried in the submerged forest, for bone when exposed to the sun perishes very rapidly. It bears No. 74.

My visit to the Valimukkam bay was paid in 1883. Since then the Ramnad zamindari has been separated from the Madura district and made into an independent district.

No similar carved bone was met with elsewhere. It is impossible to assign it definitely to any age, but from the presence close to it of a piece of black common earthenware, also washed out of the forest mud, it will be reasonable to regard it as neolithic or younger.

A small number of small buried urns and a few menhirs of moderate size occur on and near the left bank of the Vaigai near Manamadura. No menhir I came across in India showed markings analogous to Ogham script. Menhirs.

Megalithic tombs (dolmens) are known to occur in some numbers on the Palni hills especially around the great Perumal Malai peak; some of them have been beautifully figured by Father H. Hosten, S.J., in his capital paper on the megalithic monuments of the Palni plateau[1]. Other monuments as cairns have furnished the specimens of black and red pottery shown in the collections, Nos. 82_b and 82_c, found by Mr. C. Michie Smith, F.R.S.E., in connection with cairns near Kodaikanal. Dolmens on the Palni hills.

An important find of graves of the iron age was made at foot of the North Travancore hills, 4 miles from Bodinayakanur, in the Periyakulam taluk. This find was made during the construction of the Bodinayakanur-Kotagudi road in 1899. The objects found were large earthenware vessels, chatties and numerous old iron swords. A large number of chatties were found close together, all buried about 4′ below the surface and many, if not all, containing human bones. I owe this information to the kindness of my friend Mr. R. F. Thorpe, C.E, who was in charge of the road works when the finds were made.

The shape of the chatties was remarkable and quite unlike the great Pithoi found in the Tinnevelly and Chingleput districts. In shape they are like very wide-mouthed chatties with very deep narrow bodies and round bases. I mention this find though I obtained no specimens from it, because I believe no account of it has been published as yet.

It is quite evident that the Palni hills and their environs must have been a great settlement of the early iron age people.

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[1] Dolmens et Cromlechs dans les Palnis, par le Père Hosten, S.J., Missions Belges de la Compagnie de Jésus, Bruxelles, 1905.

At Atripatti in the Vaigai valley I noted a Kurumbar ring formed of gneiss and laterite blocks laid alternately. Kurumbar rings are widely distributed over South India.

At a place called Mantapa Salé three rude scrapers of mottled brown and grey chert were found on the surface of the local shingle and they are numbered 75, 76, 77. The site where I found them is east of the high road in the extreme south of Tirumangalam taluq.

CHAPTER IV.

TANJORE DISTRICT.

The only prehistoric remains found in this district are palæoliths washed out of a lateritic deposit lying to the south-east of Vallam and south-west of Tanjore city. I preserved only two specimens, Nos. 83 and 84, from Vanganum Kudi Kad.

The material used for these implements is a stone intermediate between a much indurated clay and a chert of light yellowish brown colour. The specimens found were all much weathered and for that reason in a very bad state of preservation. The best preserved, which is also the best worked, is a rather large scraper, No. 84, which seems to have been rather rudely made originally.

If any of the South Indian implements should be ranked as eolithic, the earliest and rudest of chipped weapons, they are the above two specimens, but I am not in my own mind convinced however that the eolithic type of artifact should be recognized. Too few specimens of that low grade type have been found to justify the establishment of a distinct eolithic division of the true chipped implements. I would rather regard them as exceptionally poor specimens of the palæolithic types made of very inferior material.

No. 85, a drilled piece of clay slate found a little north of Adirampatnam, I regard as of relatively recent origin.

CHAPTER V.

TRICHINOPOLY DISTRICT.

Only three specimens from this district find a place in my collection, and of these two are palæoliths made of yellow chert, a material used because no quartzite was to be found in the region.

The two palæoliths admit of no doubt as to their being true man-made implements; they are too well-shaped to allow of their being regarded as accidentally formed specimens. The third prehistoric find is characteristically neolithic, being the front half of a small celt.

All three specimens were found in Udaiyarpalaiyum taluq, the two palæoliths having been washed out of the laterite forming the plateau east of Ninniyur, nearly 45 miles north-east of Trichinopoly town. Of the two, the better preserved, a markedly pointed oval implement, No. 88, had been evidently derived from a more highly ferruginous variety of the laterite than No. 87, for it is encrusted all over with a thin crust or wash of brown ferruginous slip which masks the material of the implement. It is figured in Plate 2. The other implement, which is quite free from any incrustation, was perhaps also a pointed oval when entire, but, if so, the point was broken in such a manner that it assumed very much the shape of an oval implement.

The neolithic celt above referred to was found on the surface close to the little Hindu temple of Ottakovil (Ootakod, in sheet 79 of the India Atlas). It is made of black trap, greatly weathered.

Whether the poverty in prehistoric remains of the Trichinopoly district is real or only apparent is a yet unsettled point. The western, southern and central parts of the district, though traversed by me pretty closely, yielded no finds, and the western half of the Udaiyarpalaiyum taluq gave only the two palæoliths and the celt above described. Other investigators might possibly be more lucky. The whole of the central and eastern part of the district had been very closely traversed prior to 1863 by a number of geologists, several of them men of marked ability and large experience, including Messrs. Henry F. Blanford, C. E. Oldham, W. King, Willson and Geoghegan;

and smaller tracts in that area had been visited in those days by Dr. T. Oldham, Mr. W. T. Blanford, and the author, but none of them met with any prehistorics. It is true the ardent quest for these artifacts which subsequently sprung up had not begun then, but the fact that so many trained observers, all keenly examining the surface for fossils, missed finding prehistorics of any kind appears to prove abundantly that such remains were entirely absent or extremely rare. To me, when I retraversed much of that region in 1878, after fifteen years' experience in hunting for implements of all ages, the district appeared extremely poor, for I met with only the three above described examples.

In the north-east corner of the district a bed of flint gravel of cretaceous age occurs close to the Vellār river, but no indications of the use of this capital material for implements were met with. Its merits were seemingly overlooked by both the palæolithians and neolithians.

CHAPTER VI.

SALEM DISTRICT.

No finds of palæolithic age have as yet been made in the district, but abundant traces of the neolithic and early iron ages were met with by several observers, myself included, and finds of both ages are still being made from time to time. No palæoliths found.

The existence of neolithic remains in the shape of celts in large numbers and of considerable variety in shape became known about 1865 shortly after my discovery of the palæolithic implements in the neighbourhood of Madras was published. Shevaroy hills rich in neolithics.

The first observer was, I believe, the late Surgeon-General Cornish. The celts were chiefly found on the Shevaroy hills where they were and are still occasionally ploughed up in the fields by the local cultivators, the Malaialis, who regard them as thunderbolts—"Ceraunia"—and place them in the local temple enclosures in small rude stone cysts raised off the ground, or else stand them, the pointed end upwards, round the boles of sacred trees. A patch of red, or white, paint was first applied to one side of the pointed butt end and the celts then came to be considered phallic emblems, and are worshipped as lingas, and much valued by the country people who much object to their being taken. The only way to procure them of late years without causing ill-will has been to purchase them of the local pujaris, who are quite willing to receive a silver key to open access to the celt stores in the temple enclosures where they are deposited. My large collection of celts was procured from the little temple cysts in several abandoned villages by a planter friend, Mr. E. A. Quarme.

A remarkably fine and large celt was found at Chenangkadu on the Vattalamalai, the central peak of the small range lying north-west of the Shevaroys. The finder, my friend Mr. S. M. Hight, of Vellalakaddē estate, very kindly presented it to me. It is the largest finished celt in my collection, very shapely and but slightly weathered. It is numbered 193 in the series. Vattalamalai.

It is stated on very good authority that neolithic celts have been collected in considerable numbers by the inhabitants of the Yellagiri, the fine mountain lying east of Jalarpet junction, and are stored in cysts as on the Shevaroys. I am informed also Yellagiri.

Gutirayan. very credibly that the celt-makers had left large numbers of the implements on the Gutirayan and Melagiris, two hill groups in the western part of the district close to the boundary of Mysore State, neither of which I had opportunity of visiting. Celts have

Kalrayan malai. also been found to the east of the Shevaroys, on the Kalrayanmalais, but not on the Tainandamalais, in 1859–1861, but in those early years of my service I had not seen any prehistoric implements and my eye was not trained to recognize them as it became after my discovery of palæoliths and neoliths in the Madras (Chingleput) country in 1863. It is very possible that celts would be found on them all if they came to be visited by somebody with an eye trained to recognize such antiquities.

Bargur site. At Bargur in Krishnagiri taluq I climbed a rocky trapdyke ridge west of the village in 1887 and found on the crest of the dyke many traces of the manufacture of very rude implements of a black trap rock—so rude indeed that it was very difficult to decide what age to ascribe them to, for their shapes are not characteristically neolithic, while all the unquestionably palæolithic implements of the country north of the Vellár river have been made of quartzite of Cuddapah age. If palæoliths of stone other than quartzite were not so exceedingly rare, I should incline to regard these Bargur specimens as palæolithic in age—but of whatever age they may be they can only be regarded as the workmanship of extremely clumsy beginners in the art of making implements of stone. The specimens in the collection are numbered 194 to 201.

Types of celts. My collection well shows how great a variety of forms of celts were turned out by the makers who supplied the neolithic tribe residing on the Shevaroys. A list of 12 types of celts is given in the note on p. 21.

Either type may have a pointed or a broad butt end. Size is not considered of importance in determining the types. The practice of perforating celts to fit them with hafts seems to have been unknown in India—for I have never seen or heard of a celt which had been so treated; but one of my Shevaroy specimens (No. 99) shows circular markings very shallow, as if only commenced, one on each of the broad sides of the celt. If the boring had been carried through, the implement would have been so perfectly ill-balanced that it would have been utterly useless. It is shown in Plate 3.

The boring was abandoned so soon that there was no cylindrical edge to the scar made and no cone would have been formed as in the case of boring with a bamboo tube and sand.

A unique specimen of celt is No. 97 which has its sides perfectly square instead of rounded. It is figured in Plate 3.

A rare form, occasionally met with among small celts, appears to have been prepared by grinding a fresh cutting edge where the original one was broken off or badly blunted by use. The re-ground celts have all got square-shouldered edges. A very rare aberrant form is a thin celt with its sides bevelled almost to a sharp edge. A very good example of this, No. 106, is figured in Plate 3 in which all the types are given.

Kindred forms, but very much rarer, are adzes and hammer-axes (or axe-hammers, Nos. 159 to 163). Gouges, or chisels ground hollow, though very common in Scandinavia and known in England and North America, are, as far as I know, entirely wanting in India. I found only one doubtful specimen.

Other remarkable and interesting artifacts obtained on the Shevaroys may be here enumerated and described. The chief of these is a large ringstone, an object which but for its being too small for the purpose might well be regarded as half of a small quern, or hand mill. It measures six or seven inches in diameter and has a central hole chiselled through it of about two inches in diameter. It was found in the bed of a stream at Yercaud and given to me, but I cannot recollect by whom.

Other neolithic forms met with on the Shevaroys are "slick stones" (Nos. 165 to 168) also called "slyking stones or sleek stones," implements used in olden times to put a gloss upon the surface of cloth while still on the loom, a practice followed by weavers in the north of Ireland till quite recently. Similar stones or artifacts made of glass were used formerly for smoothing 'linen, paper and the like, and likewise for the operation termed calendering'.[1] **Slick stones.**

The celt-makers did not, except possibly in very rare cases, make their implements out of large pieces of freshly broken rock, but sought about on the trapdykes, whence they procured their work material, for fragments of rock of suitable size and shape formed by convenient disposition of the joint planes, or shrinkage cracks set up in all igneous rocks when cooling from a highly heated condition. Such suitably shaped fragments of the rocks were of very great assistance to the stone chippers as they enabled them to form their several implements with very much less labour than if they had had to reduce large pieces of freshly broken rock to the comparatively small size of the axes, adzes and hammers in general demand by their non-tool-making **Stones shaped by joint planes chosen.**

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[1] *See Sir John Evans'* "Ancient Stone Implements, Weapons and Ornaments of Great Britain," 2nd Edn., p. 441.

neighbours. If the specimens obtained, for example, from the great celt manufactory at Kupgal in Bellary District (p. 82) be examined carefully, it will be seen how very many of them show where the joint planes came in most conveniently to reduce the amount of chipping which would in their absence have been absolutely required to attain the form and size the workmen were aiming at. Examples of this are well seen in Nos. 470, 504, 561, 627 and 660 in the Bellary series. In the Shevaroy series the signs of such joint planes have been largely obliterated as they are far more extensively ground and polished than the neolithics, celts especially, occurring so numerously and in so many localities in the Deccan. The workmanship of the average celts found on the Shevaroys is so much better than that observable in the average Deccan specimens that it is impossible not to be struck by it and to speculate on the cause of the great difference observable. The conclusion, which appears to me most reasonable, is that the southern neolithic people lived in much more peaceful times and had the leisure to finish off their implements much more completely. This explanation is, of course, only a hypothetical one, but it strikes me that it is not too hazardous to be probable.

Peaceful times on the Shevaroys.

Less peaceful times in the Deccan.

The men in the Deccan were very likely exposed to attack from hostile tribes immigrating into the peninsula from the north, who would have had to overcome the Deccanites before they could descend upon the more southerly peoples.

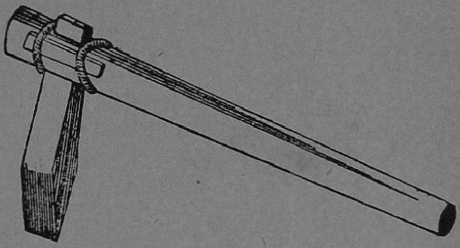
The extent to which the Deccanites, if I may so call them, made use of the castellated hills scattered so numerously about the plains of the Deccan country and neglected those which did not offer them secure refuges, shows of itself that they had much need of strong fastnesses.[1] It would be of exceeding interest to know whether the Deccan plains were mostly bare cotton soil spreads as they are now, or whether they were forest clad and that the growth and subsequent death of the forests was the source of the great spreads of forest humus which formed the regur or black soil, according to Stephen Hislop's largely accepted theory. See Addendum No. VIII.

Hislop's Regur Formation theory.

The types of the neolithic weapons and tools occurring in the Salem district and the Deccan agree so closely that one can only conclude that the people in both regions were, if not actually members of the same tribe, at any rate on exactly the same level of civilization. Unfortunately no light is thrown on this point by the remains of the actual neolithic houses, none of which are known up to the present in either region. From this it must be inferred that the people built their habitations only

No neolithic houses remain.

[1] *See* remarks on "Castellated hills", *ante* page (27).



AXE USED FOR CUTTING LATERITE SLABS
AT KOTTAYAM, TRAVANCORE.

of very perishable materials which became a prey to fire or were destroyed by mere exposure to atmospheric agencies during long periods.

No residential or manufacturing sites of the neolithic people have yet been traced on the Shevaroys, though they doubtless existed once up there. Their houses which left no permanent traces behind were probably constructed of wood and other perishable materials.

Among the interesting neolithic finds on the Shevaroy hills is a phallus No. 172*b*, a small object of pale gneiss diminishing biconically and truncated with flat ends. The specimen which is much weathered was found and given to me by Mr. E. King-Harman, the owner of the Castle Cor estate. It is of great interest as proving that the neolithic people had faith in the doctrine of male energy. **Castle Cor site.**

Earthenware phalli, which may be of neolithic age, were found in various places and their description will be found further on.

Two other interesting objects found by Mr. King-Harman on his estate were a small muller (172*c*) made of diorite and a slick stone made of trap (172*a*). With the above he also found two discs made of old pottery of coarse gritty texture—the one red, the other brown. Both had their edges ground. Such discs were found by me in many old sites and of various sizes. Where any care has been taken in their preparation the edges have been ground, but in other cases the discs had been prepared simply by rough chipping. The discs were probably pieces in some game-like shovel board in which they were pushed or thrown or kicked so as to reach appointed squares in a plan drawn on the ground. They were sometimes, but much more rarely, made of stone.

The Shevaroys proved themselves even richer in traces of the iron age than of the neolithic age, but all the remains found were derived from graves, "kistvaens", which are very numerous on the western and northern sides of the plateau. An interesting group of graves was discovered on the south-western slope at the upper end of the new cart road from Salem. The diggers in cutting the track laid open some large coarse earthenware vessels, four or five in number, which were wantonly smashed by them. The vessels were ovate in shape and between 2 and 3 feet deep with wide mouths measuring 12″ to 15″ across. *Inter alia*, they contained a number of large and shapely iron tools of which several were happily saved by the intervention of a young friend, Mr. R. F. Carey, who, having seen my collection and helped me in cataloguing part of it, knew the value of the find **Kil Mondambadi—iron age graves.**

and obtained for me all that had not been destroyed by the ignorant coolies. The contractor's assistant, although a European gentleman, was too ignorant and too stupid to prevent the demolition of the urns as he easily might have done. Mr. Carey unfortunately did not hear of the find till some days later and succeeded only in saving the iron implements which consisted of a large axe and ring, a very fine bill-hook of large size with its handle in one piece, a short sword and two javelin heads made with tangs instead of sockets, Nos. 192*a* to 192*e*. The pottery saved was quite fragmentary, only four pieces of the urns and a fragment of the side of a large bowl of painted earthenware of deep red colour. A number of lentiform beads of dark red carnelian, or paste, came out of the urns, but they were all appropriated by the coolies and none could be recovered. Similar beads were found in other burial places on the Nilgiris as well as on the Shevaroys and one of the kind is figured in Plate 17. For the iron tools, see Plates 50 and 51.

Scotforth estate—female figurines.

Of very great interest are two red earthenware figurines of women found on Scotforth estate at Mulavi by my son-in-law, Mr. Herbert W. Leeming, when digging a trench for the foundation of a wall. The special interest attaching to these figures is due to the unique style of head dress they show, namely, having their hair dressed in short ringlets all round the head and wearing high combs on the top. The figures are not artistic in execution, the faces being very plain, not to say ugly. Unfortunately the earthenware is very friable and despite very great care in handling them and packing them when they had to be moved, several of the ringlets have scaled off and as they crumbled away to powder they could not be restored and refixed. The figurines are not furnished with legs but with little rudely cylindrical stands instead, for them to be perched on, which resemble little upright vases. Only half a stand belonged to one figure when they became mine. The whole figures measure about 5⅜ inches high without their stand and there are no signs of their ever having been painted. They are figured in Plates 21, 22 and 23.

The finding of these little female figures with such an elaborate style of hair-dressing throws light upon the use of a neck rest unearthed in an old iron age site on the north (left) bank of the Cauvery river opposite to the town of Tiruma Kodlu Narsipur in Mysore and just below the sangam, or junction, with the Kabbani, or Kapilla, river. The use of a neck rest was essential if the women desired to preserve their curls intact when sleeping, which they doubtless did, a practice in which

they are followed by some of the present-day Brahmin ladies on certain special occasions. The neck rest in question will be described further on when dealing with the Narsipur pottery site which was one of the richest met with. It is figured in Plate 23.

Iron implements found in graves.

The iron age implements obtained from out of graves at Karadiyur on the western side of the Shevaroy plateau were axe heads, spear heads and fragments of blades of large knives or small swords (Nos. 174 to 181). The iron axe head, No. 174, had a broad butt unlike a very good one, No. 173, found in a grave at Moganād at the northern end of the Shevaroys by Mr. S. M. Hight, which shows a very taper butt end expanding to a rather leaf-shaped blade. See Plate 19.

The fastening of the iron axe heads.

The method of fastening the iron axe heads to their helves would seem to have been that adopted now-a-days or certainly not very long ago, namely, of inserting the butt end of the axe head into a cleft in a piece of hard wood with a couple of rings and a wedge to tighten the hold of the helve.

The rings are placed on either side of the butt end, and the wedge is driven tightly through the ring spaces and prevents the axe head from slipping; but the lower ring also prevents the cleft in the helve from extending downwards. The principle of the fastening is distinctly illustrated in the annexed diagram, which represents the form of axes used by the laterite-cutters at Kottayam in Travancore where I saw them in use in 1862.[1] I purchased one at the time, but it was unfortunately stolen when I was returning to Madras.

The great axe head of the Mondambadi find had one of these two rings found with it as shown in Plate 50. The second ring was not found.

Shevaroy hills pottery.

Of the pottery in my collection found on the Shevaroys, only one piece deserves special notice, namely, No. 192*m*, a lotah with a short side spout, given to me by a friend, Mr. Thurston Short, who dug it up on his Riverdale estate. The shape of the spout is decidedly archaic and the earthenware is exceptionally coarse for so small a vessel. It may be described as a "spouted lotah."

Thorns for arrow-heads.

A recent object found in Salem district which has bearings on the question why the neolithic people of Southern India probably did not manufacture stone arrow-heads is the large thorn of *Acacia latronum*, No. 193 *a*, which I have figured in Plate 46. In the section of the introduction devoted to a consideration of the weapons and tools of the neolithic people I have presented a hypothesis dealing with this question (see *ante* pp. 21 and 22).

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[1] and quite lately in South Canara and Malabar.

CHAPTER VII.

MALABAR DISTRICT.

The only prehistorics from this district which form part of my collection are a fine celt and a couple of beads. For the former I am indebted to my friend and former colleague Mr. Philip Lake, M.A. (Cantab.), for the latter to another friend Mr. Fred. Fawcett, Deputy Inspector-General, Madras Police (retired).

The celt is a most interesting specimen, for it is made of a pale granulite and is the only specimen known in South India made of that material. It is of medium size, very shapely and retains much of the polish originally bestowed upon it. Mr. Lake found it at the foot of the Kanyakod mountain when mapping the geology of the Palghat Gap.

I know of only one other celt having been found in Malabar, but the district has proved itself very rich in antique pottery as will be seen by the rich collection of it in the Madras Museum (*vide* my Catalogue of the Prehistoric Antiquities in the Madras Museum, pages 90 to 96). The specimens included were contributed by Mr. W. Logan, I.C.S., a former Collector of the district, and Mr. F. Fawcett.

Mr. Fawcett's beads * were procured in a cave at Mangalam Kâp in the Wynād. The discovery of the cave as a prehistoric site was made by Mr. C. Mackenzie.

* A number of beads have unfortunately lost the numbers painted on them, the oil colour having scaled off during the hot weathers that have elapsed since they were marked. My memory would not serve me to restore all of them.

CHAPTER VIII.

SOUTH CANARA DISTRICT.

Only a solitary specimen of pottery occurs in my collection in the shape of a large spouted vessel very much like a tea-pot in shape; this was found by my friend the late Mr. McMaster, owner of the Samsi coffee estate, in a thick shola a few yards south of the Mysore boundary. The circumstances of its occurrence seemed to point to the vessel being really antique, and this is supported by the facies and texture it presents, but there was no clue to its original provenance to so strangely out-of-the-way a locality. My friend who very kindly presented it to me regarded it as genuinely antique.

Since writing the above I have been informed by Mr. E. Thurston, who is much better acquainted with the South Canara country than I have had the opportunity of becoming, that this form of vessel is still manufactured and used there. Its being prehistoric is therefore quite doubtful.

CHAPTER IX.

MYSORE STATE.

Palæoliths.

My first prehistoric finds here were palæoliths made of quartzite and mostly rude in shape, which occurred very sparsely scattered on the surfaces of the pale quartzite shingle bed capping the high ground south-eastward of the town of Kadur and extending westward for several miles and resting upon the archæan rocks. This shingle appears to owe its position to the existence in former times of a small river draining the eastern slopes of the Dod Balesideru mountains, a fine group attaining a height of over 5,000 feet. Similar and equally rude implements were collected by me in small numbers from the surface of a pale quartzite shingle bed at Nyamti, 16 miles north of Shimoga town. I hit upon these implement-bearing gravels in 1881 when making a traverse across the State in a north-westerly direction.

At Kadur.

At Nyamti.

A very similar but coarser quartzite shingle to the south and west of the town of Chikmugalur requires further examination for it is a most promising-looking formation, although I failed to obtain any implements after a very careful search.

Various palæoliths, all of quartzite, were found by myself and my assistants Mr. H. K. Slater and Mr. Jaya Ram, washed out of the ragged patches of lateritic gravel lying to the south of Kadur town.

At Talya.

The majority of the palæoliths found in Mysore were picked up off the surface, but a few notable specimens were found which were distinctly connected with a thin deposit of high level lateritic gravel. This deposit yielded one remarkably fine specimen No. 205, a double-pointed broad oval of cinnamon brown quartzite. It is well worked and well preserved. It was found to the south-west of Talya in Holalkeré taluq, where a thin bed of lateritic debris is widely scattered. I have figured it in Plate 1.

At Nidaghatta.

At Lingadahalli.

The majority of the other specimens of palæoliths in the Mysore series came from lateritic debris near the villages of Nidaghatta and Lingadahalli, south of Sakrepatna. No. 209 is a good example of the discoid type made of quartzite, the material of Nos. 210, 211, 212 and 214. Nos. 213 and 215 are of white quartz, a stone not much favoured by the old chippers, doubtless because of its stubbornness and unsuitability for working. This is a

reasonable inference, for otherwise the number of quartz implements would be much greater, quartz being the commonest of hard stones in that region, but yet the variety least frequently used.

Of neolithic stone objects only two celts were collected, one by my friend and quondam colleague Dr. John W. Evans at Birmangala in Goribidnur taluq, the other by myself east of Srinivaspur in Kolar taluk. Neoliths.

Talya. Opening of a Kurumbar grave, in which nine vessels were found.

Close to my camp at Talya in Holalkere taluq was a small group of Kurumbar rings, one of which I found time to open. On clearing away about 4 feet of soil a rudely oblong clumsy slab of white granite was exposed, but no other slabs occurred in the grave to make up a cist. The slab measured about 6′ by 4′ by 10″ in thickness. It was much tilted to the east and looked as if it had been disturbed, as had been several of the other graves. The disturbance, however, if there had been any, had not extended further down. On digging down about 2 feet below the slab a small black pot was found and then a very large chatty-shaped vessel which had lost its neck and was much crushed, apparently by the weight of the slab. The big vessel bore no ornament or device of any kind and was so much injured that I did not attempt to preserve it. There was nothing in the soil which filled the big vessel and which I examined very carefully. Below the great chatty I came upon a small black chatty or large lotah half full of calcined human bones, amongst which was a lower incisor tooth. A little further down was a tall red pot of the flower pot type, *i.e.*, conical in shape and tapering down to a small truncated base. It is numbered 264*h*-3 and figured in Plate 25. Close to it was a tall red vase with four feet which had been broken off and were unfortunately overlooked in the dusk on completion of the excavation while I was superintending the packing up of my other finds. I did not notice that the feet were missing and had been left in the empty grave, nor did I find it out till a long time afterwards when I unpacked the case of finds in my house at Yercaud. Had the legs been brought, they would have been cemented on and the vase thus restored would have been photographed and half toned as it well deserved to be. It bears No. 264*h*-1.

The last vessel met with was a tall round-bottomed red pot, unbroken, No. 264*h*-4. Of the nine vessels that I found in the grave six were practically entire, two were broken up but can be built up out of their collected fragments, and one, the largest of all, as aforesaid was too much crushed to make the

building up feasible and its debris was therefore left behind. None of the vessels, except the lotah No. 264*h*-3 containing calcined bones, contained anything but the black earth which filled the whole grave. Not a trace of stone or iron was seen. See Plates 24 and 25 for figures of Nos. 264*h*, 4, 5 and 3.

Trojan facies of some South Indian pottery.

The numerous legged vessels found in India are of special interest as they strongly resemble in shape some of the vessels found by Dr. Schliemann in the ruins of Troy, which the great German archæologist discovered at Hissarlik, and figured in his first book "Troy and its Remains." To these attention was drawn by Mr. M. J. Walhouse (M. C. S., retired), an eminent Indian archæologist, in a paper in the Indian Antiquary (Vol. IV) several years ago. The Trojan vessels differ somewhat from the Indian ones in that they are rounder and plumper in shape and have only three feet and never four, and are moreover furnished with loop-handles which are unknown in Indian pottery.

Legged vessels of many sizes and several types have been found in many districts in South India, but are not met with numerously as far as I know and none occurred in the pottery sites of Gujarat and Kathiawar. They seem to have been used only as receptacles for cremation ashes.

Figures of the three- or four-legged urns found in India are to be seen in various books, *e.g.*, in the Madras Museum Catalogue of the Prehistoric Antiquities, No. 1027, plate XXIV, found in Malabar district, a four-legged example of the round-bodied type with rather short legs; a very fine example of the tall form is No. 1358 in plate XXVII, which is 21 inches high and well preserved.

Font-shaped vessel.

A very aberrant variety of the four-legged type is that figured in plate XXII (No. 1075a) which has a very short body with thick elephantoid legs, the whole thing suggesting a very rudely shaped font. The special purpose it was intended to serve is hard to divine. It comes from Malabar, from which district a very interesting collection was sent up by Mr. W. Logan, a late Collector, who took a keen interest in the archæology of the country.

Other examples of the legged type were figured by Lieutenant-Colonel Branfill from Savandurga in Mysore, by Mr. Walhouse from several places, by Captain (afterwards Major General) Robert Cole from Eastern Mysore, while specimens of the type were found by me in Bellary district (fragmentary) and a large and very remarkable and unique four-legged specimen rewarded my search in a large group of graves in the Hyderabad country,

north of the Tungabhadra river. It was badly broken and had to be built up, a very difficult task successfully performed at last by my friend Mr. R. F. Carey and awaits now the photographer's attention. A full description of it is given on page 128 and in Addendum X.

Narsipur-Sangam iron age site, with much pottery.

A very interesting and even more important find of iron age pottery fell to my lot at Narsipur (often called Tirumakodlu Narsipur) on the Cauvery just below its junction with the Kapila (Kabbani). Immediately opposite to the town I found on the top of the left bank an old site of considerable size. The great quantity of iron slag scattered over the surface and buried in the made ground proved conclusively that a settlement of the early iron age had existed there, while the excellent quality of the earthenware, for domestic purposes especially, proved also that the people who lived here had already attained a very respectable level in civilization. Curiously enough, although I was able to collect so many important specimens of ceramic art, yet not a single piece of an iron object was obtained. A considerable difference in type of vessel and system of ornamentation is observable between the Narsipur finds and those I made at the Srinivaspur site, 20 miles north of the Kolar Gold Fields, described further on; the former shows a distinct advance in the quality of the articles turned out, but also a decrease in the quantity of decorative work bestowed upon it. At Srinivaspur the pottery had been much more exposed to injurious influences and had been far more broken up and comminuted, so much so indeed as to suggest its having been deliberately and wantonly destroyed. At Narsipur on the contrary a number of pieces had been buried in the made ground of the old settlement and remained entire or had been so little injured as to show their shape and quality as well as on the day they left the potter's hands. The far superior state of preservation of the Narsipur specimens has much to do with the greater ease with which the true character of the sherds could be determined. Of the Srinivaspur find, not a single specimen was entire, or even nearly so, and but for the highly decorative patterns impressed upon the sherds they would not have been worth picking off the ground.

Srinivaspur site.

Earthenware neck rest.

The most interesting of the Narsipur specimens is No. 234-128, a neck rest of blackish grey smooth pottery, which is rather broken, the base and part of one side being wanting. Its great interest has already been pointed out, when describing the two female figurines found by Mr. H. W. Leeming on the Shevaroys (p. 62). Most of the other pottery found on the Shevaroys is of the early iron age; the probability therefore of the figurines

belonging to the same period is very great. Now the Narsipur pottery is obviously also of the same age and the very elaborate coiffure of the two little women at once suggests that neck rests would have been invaluable to their sister women who very probably indulged in similar elaborate head dressings. The neck rest is illustrated in Plate 23.

Libation cup.

An interesting little vessel, though only one half of it exists, is a probable libation cup, or sacrificial lotah, No. 234-125 made of red painted smooth earthenware and may be described as a three-storied vessel with a rounded base. It is figured in Plate 30. Vessels of similar structure but many-storied are used at the present day in Gujarat where I noticed them in front of various shrines. The largest of these turretted vases numbered no less than 13 stories. They appear to be made specially as required, for I never saw any of the kind exposed for sale at fairs and was unable to buy any though I made many enquiries after them.

Flanged bowl.

A noteworthy variety of bowl is the flanged bowl, a vessel which from its form would appear to have been used on top of a small portable hearth, such as is very commonly used now-a-days in South India and known by the Tamil name of Adipu.

Such a bowl is well shown in Plate 30, No. 252-87, though not the one from this locality, but a better specimen from French Rocks site.

Wind screen.

For use very probably to aid in cooking in such a flanged bowl is a large sherd of the upper part of a large chatty; the lower edge of this had been ground truly horizontal so that it could rest on the upper edge of the flange and be shifted about on it and make a very efficient wind-screen. It is numbered 234-127.

Many of the vessels were of considerable beauty of form or decorated with patterns, the best of which will be found figured.

Wrinkled polished surface.

The following are worthy of special notice: No. 234-36 is part of the side of a chatty form vessel of some size, black and brown in colour. The polished surface shows bands of small wrinkles. It is figured in Plate 30 as No. 234-38, but should have the sub-number 36. No. 234-44 is the lip of a large melon-shaped bowl with three wide grooves on top of the broad lip and a bold fillet of finger tip marks on the shoulder and is painted brownish red and is half polished; figured in Plate 32. No. 234-52 is the lip of a large bowl of light red half polished ware, with a fillet of curved topped leaves on the outside; figured in Plate 37. No such curved topped leaves are known to me in living plants.

No. 234-79 is the shoulder of a chatty with a fillet of highly raised thumb impressions on pinky brown rough ware; figured in Plate 39.

Raised fillet of thumb impressions.

No. 234-80 is part of the side of a large polished red chatty showing a broad reeded fillet on the bulge; figured in Plate 30. No. 234-90 is a small lotah with a slightly thickened lip, half-polished, black over red outside and black inside; and well figured in Plate 30. No. 234-92 is the side of a wide mouthed smooth red chatty with Quaker collar neck and a fillet of very shallow rays on the shoulder which would not show up well if photoed; so it was not figured.

Reeded fillets.

Quaker collar and shallow shoulder rays.

No. 234-105 is a very shapely pointed conical lid of pale pinky red rough earthenware with incurved sides; figured in Plate 38. No. 234-106 is the conical spout of a small vessel of half-polished red earthenware with seed (?) impressions round the base; figured in Plate 38. No. 234-107 is half the neck and mouth of a bottle of rough drab ware in the form of a stepped cone rising from a broad flange; a very uncommon shape; figured in Plate 54. No. 234-108 is a bottle neck and mouth of black half-polished ware, also of uncommon shape, a short cylindrical spout rising from a broad flange on which is traced a sort of leaf-pattern; figured in Plate 38. No. 234-109 is a lotah of medium size and very shapely. It is black above passing down into red and well polished all over. It has a low upright neck with a small groove just below and outside the lip. It is in perfect preservation and shows well in Plate 30. An interesting bowl figured in the same Plate is No. 234-113. It is nearly complete and is an intrinsically good specimen of the potter's work. In colour it is red outside and black inside and highly polished. A very fine large example of the high-sided "finger bowl" is No. 234-115, figured in Plate 30. It is black above and red below and well polished.

Various types of colour.

The only artifact found beside the pottery was the left valve of a large unio shell, through the centre of which a large hole had been bored, thus converting it into a pendant, but probably one of a series to be strung on a cord and used as necklace and hung round the neck of some favourite, human or animal, probably the latter. This shell, No. 234-129, is figured in Plate 41.

Unio shell pendant.

Several specimens show some remarkable markings which may not unreasonably be regarded as representing ownership marks of a people unacquainted with the art of writing; No. 234, sub-numbers 22, 24 and 120 are good examples of these supposed signs of possession.

Lakshampura.

Iron age site.

A moderately rich but very interesting series of pottery remains rewarded my search on the left bank of the Cauvery at the ferry at Lakshampura 6 or 7 miles above the Narsipur Sangam, and like those found opposite Narsipur the vessels met with may safely be assigned to the early iron age.

A number of the more interesting specimens of pottery found by me at the Lakshampura ferry are deserving of separate notices which will be found below. These specimens had been washed out of the made ground on top of the river banks by flood action.

No. 237-8 is the lip and side of a deep red polished bowl with a shallow sunk band under the lip and a very faint ownership mark on the neck. No. 237-15 is a small finger bowl black above and red below with an ownership mark. So also is No. 237-17. No. 237-22 is a very small saucer red brown inside and black outside. No. 237-28 is the lip and neck of a chatty of light red rough ware with a fillet of upturned horns below the lip and a raised fillet in the mouth. No. 237-29 is the side of a deep bowl of rough red ware figured in Plate 38 to show the strong raised fillet round it gashed with vertical incisions, a very uncommon form of ornamentation. No. 237-30 is the side of a chatty of red polished ware which shows 3 fillets and 4 grooves on its bulge. No. 237-33 is the neck of a small lotah brown red and polished which shows part of an ownership mark. Very important is No. 237-36, a large coarse brown tuyĕre the point of which has been fused in iron smelting. No. 237-38 is the side of a large tall vessel of rich deep red polished ware with very thin sides. The people that made the Lakshampura settlement must have been very advanced to have used so varied a set of crockery.

West Hill, French Rocks.

A third very important find of antique earthenware rewarded my examination of the western hill of the French Rocks[1] and of a small site just north of the saddle between the two main hills, which lie 5 miles north of Seringapatam. Several of the best specimens were found in rock shelters in which there were other indications of their having been occupied as habitations.

As in the case of the Lakshampura find the predominant type of vessel is the bowl of which there are many varieties and among them the finger bowl is conspicuous. Chatties are also a common form. Among the rarer forms are saucers, lotahs, a plate of red and polished ware, a ring stand of red colour and polished, the

[1] A pair of bold blocky granite hills most conspicuous in the landscape as you look north from Mysore City. So called because a French garrison was quartered there in Tippu Sultan's time.

spout of a vessel with a decorative fillet round the base. Several fragments were found of chatty-shaped vessels with perforated sides and bases probably used as strainers.

Swastika ornaments.

A specially interesting specimen is No. 252-62, part of the side of a large chatty with two ornaments, cruciform in shape, with a small pap in each re-entering angle and a raised garland-like ring surrounding each cross. The arms of the crosses are slightly pointed. What is the meaning of this very curious decoration? Can it be a modified "Swastika"? It is the only approach that I found in all my specimens to that symbol, and it deserved to be figured for that reason alone and will be found in Plate 36. From further study of the specimen and from comparison with a figure given by Count d'Alviella of the Trojan Swastika, I think there can be no doubt that my French Rocks' specimen must be regarded as a typical Swastika—*see* Addendum No. VI. Nos. 252-51, 62 and 63 have remarkable ownership markings on them of quite weird shapes.

A very rare object is 252-88, a little round lamp for a single wick. See Plate 39.

Bangalore race-course.

Two very interesting but minute specimens of fine grey-brown pottery impressed with uncommon markings have been figured in Plate 47. Unfortunately they are very fragmentary, still they are worth recording because of their unique character. I am indebted for them to the late Mr. Kincaid Lee, formerly a valued assistant of mine in the Mysore Geological Department, whose keen eye detected them on the Bangalore race-course. I am indebted to him also for some interesting quartz flakes and cores found by him on Mr. Minakshayya's estate, south-east of Tumkur. He also got a good series of pottery from east of Alasur tank.

Holakal hill.

Some interesting specimens of pottery were procured by Mr. W. S. Sambasiva Aiyar, B.A., of the Mysore Geological Department, in May 1896 on a hill in Sira taluq 30 miles north-west by north of Tumkur and kindly presented to me. From among them I would draw attention to the following: Firstly, No. 260-1, a small tuyère made of grey-brown medium fine clay, which has not been used. Secondly, No. 260-2, a perforated disc made out of a piece of dark brown pottery which has been well-ground round its periphery and has had a hole equally well drilled through its centre. But for the large size of the central hole I should unhesitatingly set it down as a spindle whorl, but the old spinners may have had some special reason for requiring the unusually large hole.

Rose vase.

Thirdly comes a fragment of the side of some vessel No. 260-3 which was much perforated, for the piece, though small, shows 19 holes made by pushing some sharp instrument through the outside before the vessel was fired. The thrust of the perforator was an inward one for the protrusion produced is on the inside of the vessel only, the outside, being quite smooth, whereas in perforated vessels from other sites the perforator was pushed through from inside and the outer surface is as rough as a nutmeg grater. Where such is the case the vessel was probably meant to serve as a strainer or colander. The other form may have been used as a flower stand as is still done in some parts of Gujarat where I saw in several shrines rather melon-shaped vessels into the holes in which roses with a very short bit of stalk had been stuck. Only the upper half of the vessel was perforated and when in use I was told the interior was filled with wet sand which kept the flowers alive for some time. No. 260-3 in Plate 38 would seem part of such a rose vessel.

A fourth object deserving special mention found on Holakal hill was a cylindrical bead No. 127 figured in Plate 40 made of a fibrous form of paste disposed in three layers—blue, white and red. The white and red layers are made to show by the cylinder having been made to taper at each end. The surface of the bead is very delicately striated and it is a rather pretty object.

Koganur.

At Koganur in the Davangerre taluk I found a rather remarkable drilled stone of some size No. 227, which seems to have been the socket for the pivot of a door. It is made of gneiss and shows signs of much use.

Madihalli.

A perforated disc of steatite, probably a wheel of a toy cart, was found by me on the surface between Madihalli and Komaranahalli. It is too large to have served as a spindle whorl.

Komaranahalli.

A noteworthy find is No. 254, a pyriform net sinker, or possibly a very large plumb-bob, of steatite which I picked up to the north-west of Komaranahalli. The steatite has been very little affected by weathering action which however has greatly attacked the acicular actinolite crystals exposed on the surface and weathered them completely away, or at least to a great depth. It is figured in Plate 19.

Payagod temple hill.

Worthy of observation also is half a great mace-head, or ring-stone of diorite which I found on a spur of the Payagod temple hill a few miles north-west of the Halebid temples. The mace-head No. 255a, when entire and well hafted, must have been a very ponderous and formidable weapon.

Srinivaspur great pottery site.

Several sites in Mysore State proved themselves exceptionally rich in old pottery, the ages of which are not all easy to determine. One site which yielded a great number of interesting specimens lies in the Kolar taluk to the east of the big tank at Srinivaspur, where several acres of ground are covered with much comminuted earthenware lying in a thin layer. The prevailing colour of the sherds is red, but entirely black occurs also and some specimens are brown and grey, but very few of the latter are met with. The vessels were polished, or smooth, or rough, and a great number of them richly decorated with impressed patterns of pinnate or bipinnate fronds combined with linear bands raised or sunk. Others have fillets of dots or pitlets, or trellis work painted on the sides. In hardly any case is a pattern produced in duplicate and there is also great variety in the shape of the lips of the different vessels and as well as in their sizes.

Forms of vessels met with at Srinivaspur.

The fragments are referable to a considerable number of distinct forms as lotahs, vessels with spouts, vessels with three or four legs, chatties, melon-shaped bowls, wide-mouthed bowls, vases, necks and feet of vases, lids and stoppers various in shape, also pottery discs for playing games, and perforated discs of uncertain purpose. With the pottery I found half a celt of basalt minus its butt, weathered and trimmed at its cutting edge. Half a dozen pieces of broken bangles of chank shell occurred scattered about in the layer of potsherds. Noteworthy among the broken sherds are the vase bases Nos. 202-83—91, of highly polished brown, or red and brown, colours. They are quite unlike anything found in the various other pottery sites I met with, but unfortunately so much broken that no part of the sides remains to show the general character of the vessels they belonged to. They must be described as very short or low bases. The fragments found were insufficient to allow of any attempt at restoration.

Specially noticeable are the following :—

No. 202-1, the side of a vessel, red painted showing three small grooves, separated by two shallow zones, with impressed leaflets.

No. 202-15, the shoulder of a lotah.

No. 202-16, the side of a chatty with a high fillet with vertical cord impression.

No. 202-18, the side of a chatty with a remarkable raised fillet with impressed leaflets.

No. 202-38, the side of a vessel dark brown in colour with a broad fillet of diagonal grating above two fillets of dot bars; figured in Plate 36.

No. 202-41, the side of a vessel, red and polished with 8 fillets, one raised and corded.

No. 202-48, the side of a large chatty of thick pale reddish ware with one broad raised fillet of St. Andrew's crosses and one fillet of deep round dots.

No. 202-99, a flat sherd, black, half polished with an impressed pattern like many small tents; a similar fragment was found by Mr. Robert Sewell at Gudivada in the Kistna district.

No. 202-131, dome-shaped lid of vessel, lid large and thick.

Shettihalli.

No. 238 is half a ringstone or mace-head found by the late Mr. George Lavelle to the west of Shettihalli, north-west of Seringapatam, and with it a bead of red coral (?).

Madadakere.

Flooring tiles are very rare earthenware objects and I only found one in Mysore inside the little ruined fort at Madadakere. It is numbered 261*b*. The back shows a number of oval holes made to increase adhesion when laid down.

Kaldurga.

A very remarkable and extremely picturesque hill, in the Tarikere taluq, consisting of the Dharwar basement conglomerate and other younger rocks. The prehistorics here found were met with lying on the surface of the top of the hill. They were a short flat bar of steatite with 5 necks of a raised edge; it is numbered 256 and probably represents a tally used for some special purpose. No. 257 is a flake of dark grey chert which seems to have been slightly worked. Three pieces of pottery were found worth taking. No. 257*f* is the side of a vessel of half polished grey earthenware with a vandyke pattern on the flanged side. No. 257*c* is the side of a vessel of black polished earthenware elaborately stamped with a key hole pattern and a small vandyke. It is figured in Plate 36. No. 257*d* is a fragment of the side of a grey vessel charged with a deep raised festoon.

Kotigehar iron-smelting site.

An old abandoned iron smelting site occurs to the north-west of the T.B. at Kotigehar in Mudigere taluk close to the top of the ghat leading down to Mangalore. A large tuyère of coarse earthenware with the point much fuzed was here found by me. It is numbered 269*a*.

CHAPTER X.

BELLARY DISTRICT.

Bellary district was found to be the richest in prehistoric remains of those surveyed by me after I directed my attention to such antiquities. My note-book shows a list of 77 localities at which I made finds and of these 36 must be regarded as important, either from the nature, or the number of finds made, or both.

By far the greater number of palæoliths found in South India were made of true quartzite, the most suitable material and the most largely developed in the North Arcot, Chingleput and Nellore districts. West of longitude 77° 30 W. it is not found in any quantity and the old stone chippers had to content themselves, unless prepared to undertake a long and perilous journey, with the best substitute they could find, which in Bellary district was the more siliceous variety of the hæmatite quartzite which forms such huge beds in the Dharwar system to which belong the hill ranges in the centre and western part of the district. It lent itself by no means so well to being worked into implements as the true quartzite, but still the old workers managed to turn out useful axe heads and other tools and a good find of such was made in the shingle fans lying along the foot of the Copper mountain south of Bellary town. They were found on the surface of the fans from which they had been washed out by rain action. Thirty-one specimens were obtained from the shingle fans south-west of Halakundi village and they included specimens of all the types recognized in the classical regions of Chingleput and North Arcot districts. Twenty-one belong to the pointed-oval type; six are oval, two axe-shaped and one discoid; lastly there is a reniform one which can be considered only as an aberrant type. Palæoliths. Halakundi shingle fans.

With the above were found seven other specimens of which three must rank as worked flakes, one as a scraper and the remaining three as simple flakes. Of these seven, two were made of real quartzite, Nos. 296 and 301, and the other five were of hæmatite quartzite.

In addition to the above, palæoliths of quartzite-hæmatite were found by me at the following places: Beder Bellagal (No. 302), Gadiganuru (Nos. 303, 304, and 314), Kurikuppa

hill (Nos. 305, 306, 307 and 308), Joga shingle fan (No. 309) Daroji (No. 310), Badanahatti hill (No. 311), Anguru (No. 312), Bellary Fort Hill (No. 315), Hirakuravatti (No. 313). Of this series all are of hæmatite quartzite excepting the two last, No. 315 and No. 313, which are of quartzite.

Nos. 305 and 309, from Kurikuppa hill and Joga shingle fan respectively, will be found figured as good typical specimens in Plate 2.

Of the Halakundi series of palæoliths none show traces of transport by stream action, for they are not rolled to any extent. From this fact the inference may be drawn that the people to whom they had belonged, and who were probably their makers resided near by, and very likely on the spurs of the Copper mountain from which the implements were washed down by local rains and buried in the shingle fans formed by the local torrents.

Neoliths.

The neolithic list commences with a number of specimens presented to me by my friend Mr. Hubert Knox, I.C.S. (Retired), who took great interest in the neolithic antiquities of the district, while he held the Judgeship of Bellary. His gift includes No. 315 and Nos. 347, 359 to 362, 366 to 370, 376, 378, 379, 387, 388 and 404. Several among these are very fine and acceptable specimens. Other specimens Nos. 333 to 346 were the gift of Mr. Henry Gompertz, late Deputy Superintendent, Madras Survey; they form a good series of celts with an adze, a scraper and a flaker.

Neolithic remains first found by Mr. W. Fraser.

My first introduction to the neolithic settlements of the district was due to an old friend William Fraser, M.A. (T.C.D.) and M.I.C.E., who was District Engineer at the time of my first visit to Bellary town and the western part of the Collectorate in 1872. Fraser, who had taken much interest in my discovery of the palæoliths in the Madras (Chingleput) district and had himself hunted successfully for such implements at the Red Hills, had discovered that the North or "Face" hill had been tenanted by neolithic man, and similarly also the Peacock hill, or "Kapgallu," 4 miles to the north-east, and had made a small but choice collection of celts and chisels and other domestic implements of stone and to him belongs most certainly the credit of the first recognition of the settlement of neolithic man in the Deccan. He not only very generously gave me several good celts and chisels but also took me on to both the hills where I was able to collect others for myself.

Before leaving Bellary I urged him very strongly to describe and figure his type specimens which he could have done

admirably, as he was well acquainted with Irish neolithics. Unfortunately he deferred doing so till he might have more leisure. This, however, never came and he died suddenly not very long afterwards. Unfortunately his collection was lost, or stolen, and I could hear nothing of it. To the small series of the leading forms, *e.g.*, celts, chisels, mealing stones and corncrushers, which he kindly gave me, I added a number of finds, chiefly palæoliths, made in the South Mahratta country and exhibited the collection at the Vienna Exhibition in 1873 where it excited considerable interest. I presented my collection to the Geological Survey Museum at Calcutta whence it passed on with the entire series in the Survey collection to the prehistoric branch of the Indian Museum, where I found it in 1887 and regained several of my favourites by exchange for South Indian specimens obtained after 1873.

A few residents at Bellary were led by Mr. Fraser to take an interest in the celts while he remained there, but so far as I know nothing came of their researches.

Budikanama cinder mound.

My first original observation on neolithic ground in the Bellary district was made on the 4th December 1872, a few days after taking leave of Mr. Fraser when I visited the great cinder mound on the Budikanama, a low pass by which the great trunk road from Bellary to Dharwar crosses the locally low band of Dharwar rocks running up to the Tungabhadra river from the western end of the Copper mountain ridge.

This remarkable mound, which consists largely of slaggy cinders, had already previously attracted the notice of several observers and had in one case been described as a volcanic ash cone! It was figured in the Madras Journal of Literature and Science, Vol. 7.

It was noticed by Captain Newbold, F.R.S., who estimated its dimensions at 50 feet high with a basal circumference of 400 feet, measurements which appear quite correct. He did not, however, recognise the fact that it is connected with neolithic times but appears to have regarded it as possibly a funereal mound and quotes a native legend according to which it represents the site of the cremation of Edimbaussoorah, a rakshasa or giant, killed by the hero Bheemasainah, one of the "Panch Pandus," the celebrated five warrior brethren of the Mahabharata epic.

The mound consists, as far as could be determined without excavation, of several floors of yellowish or greyish drab slaggy cinder resting upon surfaces of made ground and ashes. The mound has been scored by rain action but not very deeply owing to the hardness of the cinder floors. In several of the small

gullies I found a few corncrushers and mealing stones washed out from the made ground and in one gully I picked up a good celt. Besides these typically neolithic implements and some animal bones to be referred to later on, I found nothing noteworthy—fragments of pottery were very rare and all of coarse quality not referable to any special age. I revisited the mound several times but without making any fresh finds. Some fragments of the slaggy cinders showed impressions of coarse straw like that of the great millet (*Holcus sorghum*, the cholam and jonnalu, respectively, of the Tamil and Telugu peoples), the straw most largely used now-a-days for thatching purposes and for constructing the walls of temporary huts. From its position on the top of the little pass and from the absence of any traces of substantial stone buildings, it would seem probable that the mound was only temporarily occupied and may probably have been an outlook post, the watchers on which only occupied straw huts which were burnt down from time to time and rebuilt on the same spot. I offer this opinion, however, with much diffidence as it does not fully explain the formation of the several features of the mound now to be seen.

Hampasagara.

I followed up my neolithic finds on the Budikanama mound by obtaining a good celt of black trap from the surface of the high gravel bank of the Tungabhadra, a few yards westward of the travellers' bungalow at Hampasagara, 63 miles west of Bellary.

Registry of finds.

In December 1884, when I took up the systematic survey of the Bellary district, I met with so much success in my prehistoric researches that I started a book in which to enter the localities of my finds, the dates of each finding and a list of the principal objects collected at each place. This system of recording my finds I have continued up to date. It began with No. 1 the

North hill, Bellary.

North, or "Face," hill, at Bellary[1], on which occurred considerable traces of an old settlement of the neolithic people together with indications of the commencement of an iron-smelting industry in the shape of iron slag and of fragments of hæmatite of both rich and poor quality. This hæmatite must have been brought there by human agency, for there are no signs of any geological formation on the hill from which the ore could have been washed down, and the nearest natural source from which it could have been obtained lies in the great hæmatite quartzite beds of the Copper mountain located 8 miles to the south-westward. The assumption of the existence of an iron-making industry in this neolithic settlement is supported by the occurrence in it of a small

[1] So called from its showing as seen from the south-east a human profile remarkably like that of Napoleon Bonaparte as he lay on his death-bed.

pottery tuyère suitable in shape for the protection against direct flame-action of the nozzle of a small bellows. Fig. 386-13 (Plate 38) shows this object which had not been actually used as is shown by its unblistered surface. My official duties allowed me time for making excavations in only three cases, but not here; but I fully expect that if the made ground in this and around many other sites were turned over carefully under competent expert supervision, many discoveries would be made illustrating more fully the status of civilization attained by the polished stone people and their probable direct descendants, the early iron people.

The traces of the neolithic people on the North hill above referred to consisted in the occurrence of large numbers of celts, mealing stones and corncrushers, of each of which forms many were collected by Mr. Fraser and myself and later on by Mr. R. Sewell, I.C.S., Mr. T. H. Knox, I.C.S., and others.

A rare and very interesting proof of the residence of the celt makers rewarded my search by my finding a rock surface, near the middle of the south-east face of the hill and just on the edge of the terrace which there lies along the south-east side of the great rocky crest of the hill, on which 5 or 6 well-polished grooves, 7 or 8 inches long and 1 to $1\frac{1}{4}$ inches deep had been worn by grinding the celts to a sharp edge. The grooves lie together parallel and in close order within an area less than 20 inches square. Similar edging-grooves were found in three other localities and will be described in the sequel. Polishing.

THE FORT HILL, BELLARY.—The Fort hill, Bellary, was not recognized as the site of a neolithic settlement till much later and its recognition as such was due to my friend Mr. Justin Boys, the local agent of the Bank of Madras, whom I succeeded very fortunately in interesting in prehistoric research shortly after making his acquaintance in 1884. The neolithic artifacts remaining on the hill occur among the detached rocks which form its north-east end, the spaces between the rocks being partly filled with made ground containing an abundance of broken pottery and chips of granite mixed up with which are broken or entire specimens of neolithic arms and tools. The Fort hill.

The neolithic settlement very probably occupied the top of the hill, as did the old settlement on the North hill, but owing to the building of the comparatively modern fort by the Hindus and Mussalmans, all traces of the old stone folks have been obliterated excepting at the low northern end.

Of the implements collected on the hill that have come under my notice the two most interesting are a ringstone, or clubhead, discovered by Mr. Justin Boys, and by him presented to the Mr. Boys' and Mr. Lake's finds.

Madras Museum, and a very perfectly preserved chisel found by my friend and colleague Mr. Philip Lake (M.A., Cantab.), when assisting me in the geological survey of the district. Mr. Boys' find forms No. 176 of the Catalogue of the Prehistoric Antiquities of the Madras Museum and is figured in Plate VI. Though an incomplete specimen, it is yet of great interest from the great rarity of ringstones among Indian neolithics and from its size and excellent workmanship. A clubhead of its size and weight must, if fitted with a proper handle, have been a most formidable weapon in the hands of a strong man. In shape it was nearly elliptical when unbroken, but one-half is wanting. It is made of diorite and was worked up to a good polish, though now somewhat weathered and bruised. The drilling of the helve-hole is excellently done.

Mr. Lake's chisel.

Mr. Lake's chisel, No. 402, is in my collection, as he very generously gave it to me. It is a perfect specimen and in as fresh a condition as when it left the hands of its maker. It is made of very dark greenish black trap, a diorite apparently, and is more or less polished all over. The high degree of polish it shows must have been preserved by its having been buried very shortly after its completion and continued so, entirely protected from atmospheric influences, till a very short time before Mr. Lake found it in the ditch at foot of the slope into which it had been washed down by rain action. It has a wedge-shaped edge and is so ground as to have square corners to the edge and to be a very business-like little tool. It shows no signs of having been subjected to hard use. Its dimension will be found given further on. I have figured it in Plate 6.

Kupgal hill.

Kupgal or the Peacock's hill.[1] This hill, to which as before mentioned I had been introduced by Mr. Fraser in 1872, proved to be the most important neolithic settlement in the country and was most prolific in implements of all kinds and in all stages of manufacture, as it was the site of the largest neolithic manufacturing industry as yet met with in any part of India. I cannot unfortunately give an illustration of it not being a photographer, and no freehand drawing of such an immensely blocky hill could possibly convey a really truthful likeness of it.

The hill, which lies 4½ miles north-east of the Bellary North hill, rises boldly some 500 feet above the black soil plain and forms a very striking feature in the landscape.

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[1] The "Peacock's hill" is the English name given by the residents at Bellary. Of the full native name (Telugu) "Kapgallu," which is in daily use, the last syllable is generally omitted. In former times when the hill was probably better wooded, because less afflicted by goats and two-legged wood thieves peafowl may have existed on it, but I saw none when climbing all over it.

The summit of the peak consists of great masses of rock forming a kind of keep in which are several good rock shelters. The actual summit is inaccessible without a ladder some 20′ to 30′ high, and with the upper part of the hill forms a very defensible citadel. The citadel includes three linchets, the lowest of which is kept up by a rough stone revetment. In the rock shelters there are several polished places on the rock floor formed probably by grinding grain with flat mealing stones. Alongside the small stream flowing down the sloping valley between two small tanks and about half way down between the two tanks, I observed no less than seven large granite blocks which had evidently been used for domestic purposes but were partly broken. On the second big linchet lay an oval trough polished by use and into which a hole had been worked at a later time, such as one sees now-a-days in stone rice-mortars.

The summit rocks.

Only a few stray finds of celts were made on the higher part of the hill; but lower down on the working ground among the working debris, implements of all kinds and in all stages of completion were met with numerously—the most noteworthy of my finds being the following, many of which are figured :—

Mealing blocks.

No. 455 is a celt made of a basalt-like material in the final stage remarkable for its narrow shape and very straight sides.

No. 463, which I have figured in Plate 61, is a very large and fine celt which had reached the second stage when left. The plate shows the second process of manufacture, or "pecking," remarkably well. This process was the breaking down the ridges between the chipping faces, by pecking them with a pointed chisel-like tool and would greatly diminish the quantity of grinding to be got through. This specimen is the largest and finest of the kind that I came across anywhere.

Celts.

Nos. 464 and 465 are excellent examples of the short and thick type of celt which I have described as the "battle-axe" type.

No. 472 is a very shapely adze-like celt in the second stage.

No. 494 is a good example of the broad type of celt, and No. 519, a good specimen of the narrow type. The latter is made of black hornblendic schist, as is also No. 526, which is so narrow as to be a near approach to the chisel-type. It is a finished specimen. No. 602 is a good axe-hammer and is figured in Plate 20.

No. 625 is a celt in the first stage, evidently selected because, of four joint planes which would greatly diminish the labour of making the implement.

No. 649, a scraper of very typical shape with a rather pointed butt, is figured in Plate 52. It is the most perfect scraper I came across and a really remarkable specimen.

No. 658 is a nearly circular scraper of an uncommon type, a figure of which is also given in Plate 52. No. 781 is also a circular scraper found on a later visit. None of the scrapers that I came across show any attempt at grinding.

Two other specimens found at the Kupgal site that deserve notice are No. 790, a muller of basalt with four ground and polished sides, and No. 790*a*, a corncrusher rather cubical in shape, with one side rounded, and made of pistacite granite and of very pretty pink and green colours. This stone was evidently much admired by the neolithic people, for in many old sites it must have been brought a considerable distance. Its colours which are frequently very bright seem to have been the special attraction it offered.

The castellated summit of the Kupgal offered to its inhabitants several fine rock shelters of which they doubtless availed themselves gladly. One reason and probably the principal one for the special attraction of the celt makers to the Kupgal was the existence of a great dyke of dioritic traps which traverses the hill axially in a N.W. by W. direction. This dyke furnished the stone workers with an inexhaustible supply of excellent material of two sorts, the coarse black diorite and a fine grained pale greeny grey to drab trap which occurs in lenticular masses, often of large size, included in the great diorite dyke.[1]

Kupgal trap-dyke.

The greater number of the celts collected on the Kupgal by me, and they amounted to over 180, had been made of the fine-grained stone, and the same was the case in the collections made subsequently to my visits by Messrs. Sewell and Knox and which I saw later on. Celts made of this material, or one exactly corresponding to it, were found in some of the adjacent sites, and were doubtless carried from there.

The celt factory.

The site of the celt factory was on the north-east slope of the hill below the outcrop of the great dyke and here the surface among the grass and shrubs is thickly covered with flakes of the two kinds of rock which were produced in the process of manufacturing the various implements. It was among this extensive spread of waste material that I procured my specimens which were found in all the several stages from the roughest beginning to the most finished and highly polished axe, adze or chisel. From the great number of implements I procured during my first visit to this part of the hill, I came to the conclusion that this old celt factory had never before been visited by any one taking any interest in the neolithic artifacts and that the place remained in much

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[1] A very unusual phenomenon for the trap-dykes which occur in such great numbers on the Deccan plateau.

the same condition as it had been left in by the old work people who abandoned the manufacture of stone implements very probably in consequence of the advancing state of the iron industry.

The weathering of the dyke.

Mr. Fraser must have stopped short on the great east shoulder of the hill which overhangs the manufactory in the form of a great cliff due to the more rapid weathering away of the diorite as compared to the granite, especially on its eastern side and scarp. The intruded dykes almost invariably weather much more slowly than the granitoid rocks they were injected into and consequently form ridges standing well up over the general surface. The granite of the Kupgal has weathered so much more slowly on the south side of the dyke that it remains standing up as sharp cut as a wall and forms a most conspicuous feature in the landscape as seen from the north or north-east.

Stages of celt manufacture.

As the celts and other polished implements are met with in different stages of manufacture from the very earliest stage of chipping to their completion as highly polished weapons and tools, I give in the catalogue after the definition of each specimen a number indicating the state of completion that it had been left in by its makers. The numbers I use have the following meaning: No. "1" implies that the implement has been simply chipped into form roughly; No. "2" indicates that the implement has been advanced a stage by "pecking," that is breaking down the angles of the different chippings with a sharp pointed instrument with the object of decreasing very greatly the quantity of material which would have to be removed by grinding. The effect of the pecking is very well shown on No. 463 figured in Plate 61. No. "3" shows that the implement has been ground and all excessive roughness removed, and No. "4" implies that the ground surface has been polished and the implement completed ready for hafting by whatever method was in vogue in those early times. Few traces of the method or methods then prevailing in India have come down to the present day, so one can but speculate as to the nature of the plan. The fact that the plan of drilling a hole through the body of a celt was not followed, even if it was known, proves that the Indian makers were less intelligent than the neolithic folk of the Swiss lake-dwellings, of Scandinavia and Great Britain and other European countries where perforated axeheads are abundant.

Belted hammers.

On only two of my neolithic finds are there distinct indications of the mode of attachment practised; these are both what are

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[1] A very unusual phenomenon for the trap-dykes which occur in such great numbers on the Deccan plateau, and which weather in by far the most cases slower than the country rock whatever it may be, and form very conspicuous ridges.

termed belted hammers, one found in Bellary district No. 1552*a*, the other in Kathiawar No. 3428. The former is a broad round-faced hammer made of granite. The round face is much broader than the butt end and there is a very distinct constriction round the middle of the hammer to enable the hammer to be attached to a haft of some kind; possibly only a strong withy such as that shown in Figure 105 (page 168) in Sir John Evans' classical work, "The Ancient Stone Implements, Weapons and Ornaments of Great Britain." This hammer would appear to have been left unfinished because of its having had a large piece broken out of the edge of the striking face. The other hammer alluded to will be fully described in Chapter XXIV which deals with the prehistorics of Kathiawar. In its general shape it was very near akin to the specimen just treated of, but it had been completely finished and highly polished all over, but after that greatly injured by rough usage. The highly polished deep belt-groove remains nearly entire and shows the great care which had been bestowed upon the hammer.

Hafting of the axes.

The hafting of the true axes could have been done with less difficulty, as from their elongated and slimmer shapes they could have been better fitted into a hole in a club-shaped branch of a tree of which the wood was very tough and durable, such as that of *Hardwickia binata*, the Accha Maram of the Tamil people.

No evidence has been obtained that the neolithic people of India had become acquainted with the plan so largely adopted by the Swiss lake-dwellers, of fitting the taper end of the axe into a piece of staghorn, and this into the club-headed haft, the great toughness of the staghorn being supposed to assist the wood of the haft in resisting the striking strain.

In his very able book "Urgeschichte der Schweiz", Professor Heierli gives on pp. 117 and 132 figures of several celts with staghorn fittings to strengthen the hafting. And many illustrations of this practice are given also in Dr. Munro's splendid work "The Ancient Scottish Lake Dwellings or Crannogs."

Other stones employed for conversion into culinary implements.

For purposes other than the manufacture of celts, adzes, hammers, chisels and scrapers the neolithic people were much less restricted in their choice of materials; thus for mealing stones and corncrushers they used many varieties of granite, gneiss, hæmatite jasper, grit stones of Dharwar age, crystalline limestone, and many varieties of trap rock.

Small tools made of siliceous stones.

For small tools they made great use of siliceous stones as chert, agate, chalcedony, bloodstone, lydian stone and rock crystal; these were converted into flakes of sorts, small scrapers, and strike-a-lights. The preparation of the flakes gave rise to the making of large numbers of cores of various sizes, which

are much more commonly met with than the flakes which had been struck off them and applied to various purposes.

The flakes prepared were used for various purposes such as knives, saws, drills, lancets, etc., and in addition to these are the very interesting smaller forms known as pygmy flakes, the best of which are made of agate and chalcedony.

Although the lower parts of the Kupgal are not murally scarped, they are so steep on all sides except the north-east that they could have been very easily defended against any assailants from below. The inhabited parts of the old settlement would seem to have been the citadel and its linchets and the little shallow valley which slopes down eastward from the very rocky summit. The soil of this little valley mostly consists of made-ground held up in several places by low retaining walls carried across as if to form tiny tanks by ponding back the little rill which during the rains flowed down from the top. The little walls are built of smallish stones without any mortar. Below them are little sloping surfaces, some covered with grass, others bare or rough from the trampling of cattle when wet. Near to the point at which the great dyke cuts across the axis of the little valley, the ground falls suddenly at a steep angle and becomes quite rugged and unfit for habitation and all traces of such come to an end.

Habitations of perishable materials.

No traces of huts or houses were noted, from which fact it seems safe to infer that the old stone-workers contented themselves with habitations of straw or plaited twigs which, when abandoned, quickly crumbled away to dust and left nothing to indicate that they once existed there. Even mud-built huts leave no traces of themselves when in exposed positions, but are absolutely destroyed and washed away by the violent rains of the two monsoons and the yet more furious downpours which accompany some of the hot weather thunderstorms.

"Graffiti" rock bruisings.

On the north side of the hill after crossing the small stream alluded to several times, the trap-dyke has weathered much more slowly than the surrounding granite and stands up in a conspicuous low cliff on which a number of very interesting graffiti were found by Mr. Hubert Knox in the eighties. That side of the hill had not been visited by me, my attention having been entirely taken up with the working site from which the cliffs are not visible. I had no opportunity of visiting them till I returned to Bellary in 1903, but I had been furnished through the kindness of Mr. Knox with a set of good photographs [1] of the graffiti which are really rough sketches of human beings in groups and

[1] Taken by Mr. Fred. Fawcett, Deputy Inspector-General of the Madras Police, retired.

singly and many figures of birds and beasts of various degrees of merit. They cannot, strictly speaking, be regarded as sculptures, for they are far too little raised to be considered bas-reliefs. Rock-bruisings would be the best term by which to describe them. They were, I doubt not, produced by hammering the weathered surface of the rock with stones more or less sharp-pointed, a pastime not infrequently indulged in by the herd boys of the present time whom I have sometimes come upon so occupied. It is true they always ran away when I approached, but I examined their rude hammerings carefully and never found the streak of an iron tool on the freshly bruised surface.

These rude hammerings are but rarely met with, for the simple reason that rocks with surfaces of suitable character to be worked upon are themselves of very infrequent occurrence. It is only on trap rocks that the desired surfaces are found, and the ordinary run of dykes do not show upright steep faces, such as tempted the artists of the neolithic days to depict the various human and animal figures they were familiar with and whose appearance they wished to record.

The groups of figures are best to be seen by climbing up to the dyke from the north foot of the hill.

The principal groups are the following :—

Photograph No. 11.—Represents the face of the dyke with obscure human figures. Also a well drawn figure of a bustard looking to the left. This is to my mind by far the best of all the figures to be seen on the face of the dyke.

No. 12.—Figures of two elephants of a very lean type standing tail to tail and looking one to the right and the other to the left both figured on the face of the cliff.

No. 13.—View of the face of the rock with two figures, one a large tall bird possibly a flamingo with a big tail and a thin body ; he is looking to the right. The second is a bull with a high hump and lyrate horns. His feet are indistinct.

No. 15.—Shows the face of the rock with the figure of a large bull with spreading horns looking to the right. A small obscure figure of a human being is running towards the bull's neck.

No. 17.—A small bull looking to the left is shown on the cliff face.

No. 18.—Shows a very small bull looking to the left. Behind him are two figures of men advancing left and holding round shields. Their right arms are upraised as if hurling javelins ; but the weapons are not shown ; a round shield-like disc floats in the air. In the left hand corner appears a small short-tailed animal with its head erect. Behind it (to the right) are a lingam and a crouching bull of a very modern type, and over it a tiger

whose head does not come into the picture. Other figures appear on the two rocks shown, but are too indistinct to be recognized with any certainty.

No. 19.—At the base of the left central rock shown is a faintly delineated six-rayed star. To the right is a human figure standing against the trunk of a tree. Above the top of the tree which bends to the left at a right angle are two rows, one above the other, of skeleton men marching. On the right central rock are five rows of the skeleton men all marching.

Some of the other figures are strangely obscene and quite indescribable. Some of the photographs have lately begun to fade badly.[1]

Gadiganuru neolithic site and cinder camp.

The neolithic site next in importance to the Kupgal is at Gadiganuru ($23\frac{1}{4}$ miles west by north of Bellary) a few hundred yards north of the travellers' bungalow which lies on the north of the local river, while the railway station on the Bellary-Gadag branch of the Southern Mahratta line lies on the south side of the river. The neolithic site lies at the foot of a considerable hill and includes the remains of a cinder camp from which and the surrounding fields I procured a large number of fine celts, the great majority of them very well finished. Among these celts was a form peculiar to Gadiganuru. A few specimens of the kind were also found in some of the neighbouring sites, but that they came from here may be safely asserted, as the material they are made of, as well as their shape, are a speciality of this place. The material is a trappoid hornblendic schist which occurs only, as far as my very close search went, in nests (pockets) included in the archæan rock series. Those I found lie to the west of the old site. The schist is a very dense and hard one, slightly fibrous in texture and black in colour. The celts made from this black schist are very unlike the average neolithic celts made of basalt, or diorite, being much thinner and wider, and may well be regarded as the prototypes of the early iron age axes, which they approach considerably in general shape. In but few cases did a celt of this type show a narrow or pointed butt, the butt resembling the cutting edge except that it was rather narrower and was blunt instead of sharp. A fine example of this type of celt is figured in plates 4 and 5.

Celts of archæan schist.

The celts of the ordinary type are rarely polished, but are with few exceptions very well shaped. Most of them are made of basalt or diorite which must have been procured from some distance, there being no dykes of either rock in the immediate vicinity.

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[1] They are not included among the exhibits.

Gadiganuru cinder camp.

A good-sized cinder camp, square in shape, occurs about a quarter of a mile north of the travellers' bungalow at Gadiganuru, and $23\frac{1}{4}$ miles west by north of Bellary, at the foot of the hills to the north.

Only a few specimens of antique pottery were obtained from Gadiganuru and no great show of fragments was observed either in or around the cinder camp. Of the collected specimens, though none were entire, a few showed noteworthy specialities of shape, such as a broadly incurved crutch shaped lip No. 1213_{11} or similar crutch shaped out-turned lips Nos. 1213_6 and 1213_8. One of the specialities of the neolithic and early iron age vessels is the great rarity of handles of any kind, but Gadiganuru furnished two examples, No. 1213_1 probably one of a pair like the handles of a Greek type vase, rather rudely made however. The second example No. 1213_{18} is a broad and thick object like a protruded human tongue turned downwards. If a handle, it was, like the foregoing, probably one of a pair attached to the sides of some deep heavy bowl. It is figured in Plate 38 and may possibly be the tongue of a grimacing idol.

General absence of handles.

The great rarity of handles of any kind and the total absence of such of slight and delicate structure, suggests the idea that the true cause of their non-occurrence was that the clay used for the different vessels did not acquire the needful tenacity on burning, and the potters did not therefore indulge in making such appendages to their fictile creations. The great variety of shapes they produced and their elegance and the beauty of the patterns with which they decorated many vessels show clearly that, if their materials had been good, they had quite enough taste to produce far more elegant shapes than they actually attempted.

Cinder camps.

Among the most remarkable prehistoric remains in Bellary district are the cinder camps and mounds which occur at various places and deserve careful study and attention.

The first person who noticed and described these remarkable accumulations of scoria was, as far as I was able to ascertain, Captain Newbold, a distinguished geologist and naturalist, who made many traverses in different parts of Southern India and described them in a series of most interesting papers published in the Madras Journal of Literature and Science. He appears to have been acquainted with four only of these mounds, the two situate at the eastern foot of the Kupgal or Peacock hill, four miles north-east of Bellary Cantonment, the well-known conical mound on the Budikanama, and lastly the great mound at Nimbapur, a little east of the ruins of Vijayanagar.

The Kupgal camps.—At a little distance from the north-east end of the hill lie two of these cinder camps which have been much injured by agricultural operations carried on around them and by the passage all over them of herds of cattle which has broken down the cinder vallums. I will call these camps Nos. 1 and 2 respectively. No. 1 stands nearest to the north-east of the hill and measures 240 paces in circumference, and the cinder vallum of the north side which is least broken down stands 15 or 16 feet above the surrounding fields. I found several celts among the cinder talus of No. 1, as also some good fragments of antique red pottery. The camp is nearly square in plan. **Kupgal cinder camps.**

Camp No. 2 stands between 300 and 400 yards to the south-east of No. 1 and is a rather smaller enclosure measuring only 210 paces in circumference. The height of the cinder vallum is only about 10 feet.

Budikanama mound. The Budikanama mound certainly dates from neolithic times, for on ascending it in 1872 I found in a rain gully, very near the top of the mound, a celt and several mealing stones, also part of the horncore of a bovine animal with some of the slag adhering to it. These had evidently been washed out from under one of the uppermost floors of earth lying between the masses of cinder.

According to Newbold the mound was described by a Hindu legend as the pyre of Edimbaussoorah, a giant killed by Bheemasainah, one of the famous Panch Pandus.

In a paper which appeared in the Madras Journal of Literature and Science, the mound is described and figured.[1]

Of the other cinder camps, all of which seem to have been unknown to Newbold, two occur at Halakundi 11 miles south-west of Bellary town. The larger of these is about 60 yards square, but the cinder vallum had been much trodden down and only about 5 feet in height remained when seen by me in December 1884.

Captain Newbold on Kupgal. Excellent observer though he was in general, Captain Newbold missed discovering the neolithic remains so largely scattered over the eastern slope of the Kupgal, where there had been the important celt factory above described, as shown by the great number of celts I collected there in all stages of manufacture during my third visit in 1889. Newbold seems to have ascended the hill by the path beside the little stream flowing eastward from just below the summits, along which there were but few traces of neolithic occupation, only a number of broken troughs cut in blocks of the local granite. It is very probable too that the

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[1] Vol. 7, 1838.

slopes of the hill were very much more overgrown at the time of his visit than when I climbed it in 1884; it is quite possible too that his eye not being acquainted with celts and other neoliths he passed them by unnoticed and was unaware of the existence there of a settlement of the polished stone age. Whatever was the cause of his overlooking the great celt factory and the graffiti on the north cliffs, he arrived at the conclusion that the great cinder mounds were remains of former funeral practices of great pyres, a conclusion he had formed with reference to the great cinder mounds at Nimbapur and the Budikanama; and accepted the Hindu legendary account of their origin as the pyres of "giants, demons or demigods" or the traces of "enormous human or animal sacrifices performed by holy Rishis" in the olden times. In this idea he is followed by Mr. Robert Sewell, I.C.S., retired, who took great interest in the cinder mounds when stationed at Bellary and in 1898 read a paper on the subject to the Asiatic Society. Though a great admirer of Captain Newbold's work and quite prepared to accept most of my friend Mr. Sewell's views on most of his historical researches, I cannot but think they both went wrong in not seeing the close connection with the neolithic settlements of the majority of the cinder camps.

Mr. Robert Sewell's paper.

Kupgal cinder camps.

I revisited the Kupgal "Cinder Camps" (as I prefer to call them for I do not regard them as mere mounds) in February 1903, after having read Mr. Sewell's paper and was only confirmed by further finds that I then made, in my view that they were formed in neolithic times by the neolithic people.

Good specimens of the cinder are included in the collection. No. 837_{33} was found in Camp No. 1 and No. 837_{34} is a large lump of it from Camp No. 2.

Traces of straw in the cinder masses.

In several of the cinder specimens are very distinct traces of straw showing that it was largely a source of the siliceous material mainly composing the cinder masses. Cinder from the Budikanama mound shows the traces of straw very clearly.

If the mounds of cinder had been originated by great holocausts of human beings or animals, it is hardly possible that many traces of bones should not have remained; indeed the specimen of a bovine horncore with cinder matter adhering to it which is referred to in connection with the Budikanama mound proves positively that bones did remain in some cases. But beyond that solitary bone I came across none connected in any way with the cinder-forming conflagrations.

The origin of these great accumulations of cinder or scoria has been a subject which has greatly occupied my thoughts, and I have been led to form conclusions very different from those of

Captain Newbold and Mr. Robert Sewell who regard them as cremation sites of later ages than the neolithic period, with which I consider them to be most distinctly connected, by finding so many celts and so much antique pottery among the debris talus of the two Kupgal camps and yet more from the study of two other very important camps, neither of which was known to either Newbold or Sewell. These two camps are those occurring at Gadiganuru (21 miles west by north of Bellary) and at Lingadahalli in the Alur taluk 29 miles to the north-east, at both of which large numbers of celts were found, mostly in the centre of the camps, which celts and many other neolithic objects will be seen by visitors to the Madras Museum or realized by readers of my catalogue raisonné whose pages clearly show the same facts.

NOTE.—*Size and shape of the Cinder Camps.*

Kupgal No. 1.—Rudely square, each side measuring about 60 yards, and the vallum 15′ or 16′ high where best preserved. Several celts were found by me on the cinder slopes here and also camp No. 2.

Kupgal No. 2.—Rudely square, each side measures about 50 yards and the remains of the vallum stand about 10′ where least broken down.

Halukundi camp No. 1 (south-west of Bellary).—Square in shape with an external measurement of 60 paces a side. The vallum has been greatly broken down and spread inwardly as if by the trampling of cattle assisted by burrowing animals. The remains of the vallum are only about 4′ high. Camp No. 2 was found to be smaller and very ill preserved.

Gadiganuru camp (23½ miles west by north of Bellary) lies close under the hill north of the travellers' bungalow and is square in shape and of good size, but the vallum had already been very greatly destroyed at the time of my first visit in March 1885. Large numbers of celts and other neolithic objects were found in connection with it, which did not allow of a moment's hesitation in deciding on its neolithic age.

Sanavaspur camp—which lies in the open plain to the south-east of the village of that name, 16 miles north of Bellary, is a rather irregular oblong measuring 75′ by 55′ with a vallum from 5′ to 6′ high except on the north side which is broken down into an inclined plane. The pottery found here shows a neolithic facies.

Lingadahalli camp.—(29 miles north-east of Bellary) is approximately circular with a circumference of 254 paces. The vallum is a rather low one.

Its age is unquestionably neolithic for inside the enclosure I collected with my own hand 36 celts and 11 other objects neolithic in facies, as were also 166 flakes, 21 cores and four articles of pottery.

The cinder surfaces support no vegetation whatever as a rule.

Cinder Mounds.

1. Beside the "Cinder Camps" there are a number of mounds of the same sort of cinder which can only be styled mounds as even the largest of them show no approach to the vallated structure of the camps. Budikanama mound is the largest of these and has been described at page 79.

2. The third in point of size, the Nimbapur mound, a little east of the ruins of Vijianagar (Hampi) I notice next because it was described by Captain Newbold who mentioned the native legend that it was the ashes of the giant Bali.

The dimensions of the mound given by Newbold are: length 45 yards, width 18 yards and height 10 to 14 feet. They appeared to me to be correct. I examined the mound very carefully, but found nothing whatever to assist in

determining its age which may be and very probably is post-neolithic. There were no enclosures of any kind visible in the cinder mass.

If it had been the site of a great holocaust of animals of any kind, it appears very improbable that not a single bone should have escaped destruction.

3. The largest cinder mound I came across occurs at a place called Kanchagara Belagallu in Alur taluk (25 miles N. 5° E. of Bellary). It is oval in shape, and 70 paces in length by 40 at its widest part.

Its age is probably neolithic, for I found a celt No. 1462 lying on its surface, also many corncrushers, several mealing stones and two small troughs of granite, but I brought away only the celt and a fragment of a large thick unio which may have been used as part of a collar.

The celt, a large and heavy one, was greatly weathered and had evidently been long exposed.

4. Of very much smaller size is the cinder mound half a mile south of Sugura. The mound which is a very flat one showed no enclosures or surface objects by which to attempt a determination of its age. Still smaller cinder mounds were found in other localities. Kakballa hill (26 miles W. by N. of Bellary) shows a patch of cinder in a saddle and three small mounds at foot of it, none of which yielded anything definitely fixing their age. But the pottery and some selected stones found on top of the hill were of neolithic facies.

5. A noteworthy cinder mound is to be seen on Kurikuppa hill (17 miles west by north of Bellary), a neolithic site which yielded numerous interesting specimens.

6. Another spread of cinder occurs in a corner of the hill north of Saridamma Konda, west of Sanganakallu village. Here also nothing is visible imbedded in or weathered out of the cinder mass giving any clue to its age, whether neolithic or post-neolithic.

This mound is of quite small size and thickness.

A possible explanation of the origin of the camps suggested itself to me when reading the late Sir Henry Stanley's most interesting book "In Darkest Africa," in which he mentions (Vol. II, page 520) a very remarkable practice of the natives of the village of Mukunga on the Albert Nyanza of piling up great circular mounds of cowdung inside the thorn fence known as the Zeriba which surrounds all villages and hamlets in that part of Africa. These great mounds of cowdung would be liable to take fire when dry in the hot weather and unless the fire were purposely extinguished by the people it would go on smouldering and the ashes produced would be of a scoriaceous nature. In sites that the people were attached to, the cowdung mound building would undoubtedly be continued by generation after generation and the mound would be occasionally burnt. Seeing how careless the lower classes of natives of India are about fire now-a-days, it may not be too hazardous to assume that their neolithic ancestors were equally so and that conflagrations were not of very rare occurrence. In a cotton soil country the formation of a layer of cinder would be useful at times for the reason that in the rainy season the surface of the cinder bed does not become an utter quagmire as does that of the black soil, but keeps clean and dries rapidly.

Burning of cowdung mounds a possible cause of cinder camps.

Details about the several camps are given in pages 93 and 94.

None came under my observation outside of the Bellary district, though my traverses of the adjoining district were very close ones, but quite lately I heard from my friend Mr. Bosworth Smith that he found two typical camps near to the Wandalli Gold mine in the Raichur taluk, Hyderabad State.

He had an analysis made of the cinder by Mr. W. E. Smith, Professor of Chemistry at the Presidency College, Madras, which I am allowed to give here—

	Per cent.
K_2O	1·11
Na_2O	2·54
CaO	10·89
MgO	3·89
Fe_2O_3	17·27
Al_2O_3	4·51
Co_2	5·30
P_2O_5	1·17
H_2O (at 100°)	0·20
SiO_2	53·10
	99·98

It was in this district that I met with for the first time beads made of freshwater shells ; in this case the common Paludina, of which I found two specimens in a small site on the south or right bank of the Tungabhadra 3 or 4 miles east of Hampasagara. The shells were converted into beads by grinding a hole into the lower whorl through which a string could pass out of the mouth. With these beads was a great quantity of broken antique pottery and a number of broken bangles made of chank shell. One of the Paludina beads and three of the bangles are figured in Plate 41. Their numbers are 1518–2, –5, –6 and –9. On the same plate I have figured a section of a Mazza shell sawn ready for the carver. No. 1518–24 is an untouched Mazza rapa placed in the collection to show an example of the shell so much valued by the old folks of the early iron age, if not already used by the neolithic people.

Shell beads in old site east of Hampasagara.

The finding of several good and sharp clay scrapers is proof positive of the existence of a leather dressing industry. Several forms are known, *e.g.*, No. 649 with a pointed butt and No. 658 which is nearly circular. These two are figured in Plate 52. The finest example met with by me is numbered 1401 and was

Leather industry and scrapers.

found in Sanganakallu 3 miles north-east of Bellary town and its good shape and large size may be well judged by the figure given in plate 52. It is made of basalt.

Bull amulet. A very interesting charm, or amulet, was found by me buried under the threshold of a ruined pond built house, on the top of Narasimdevera gudda 8 miles south-east of Harpanahalli. The amulet is in the shape of a crouching bull with a huge hump. Below him are three well drilled holes for his attachment, probably in an upright position; the threshold, a thin light stone, got kicked over and the bull lay exposed unweathered. The figure is made of sericite schist of pinkish colour and is figured in Plate 16 (No. 1521).

CHAPTER XI.

ANANTAPUR DISTRICT.

Only the northern part of this district was surveyed by me, but it proved to have been largely occupied by the neolithic people and the numerous sites they had occupied yielded a large number of interesting objects.

The northern part of the district is in its physiographical appearance much like the south-eastern part of the Bellary district, an open country, from which rise a number of granite hills, most of them more or less castellated in character and offering strongly defensible and desirable sites which were much resorted to by the old neolithic folk. The plains between these hills are now regur-covered flats, mostly very bare of trees, but whether they were so, so many centuries ago, is a problem towards the solution of which I procured no evidence.[1] Anyhow, the possession of the strong rocky fastnesses commanding the plains for a considerable distance around their base must have enabled the people to cultivate the immediate surroundings of their hills with a very considerable degree of security, as the look-out they doubtless kept on the top of the hill would give the cultivators timely warning of the approach of enemies. Out of 23 localities at which I made finds, I reckon eight to be really important sites, nine to be only moderately important and the remaining six as unimportant.

The important sites are the following :—

Lattavaramu hill.

(1) Lattavaramu hill.—A conspicuous semi-castellated pointed hill, about 33 miles north-west from Anantapur, had evidently been inhabited for a long period by the neolithic people, judging by the large number of used and broken implements found on the western slope which alone was occupied and right up to the summit, the other sides of the hill being too steep for residential purposes. No signs of domiciles remain, but only a number of blocks on which there are rubbing places used probably for mealing purposes. On account of their great weight none of these were brought away. The Lattavaramites had shown a great fondness for pistacite rock for use as corncrushers, no less than a dozen of that type being in the collection Nos. 1661, 1663 to 1665 and 1667 to 1674, the bright colouring of the rock being doubtless the attraction.

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[1] See p. 60 ; also Stephen Hislop's Theory of the Formation of Regur, p. 60 ; and Addendum No. VIII.

Taken as a whole the Lattavaramu specimens are a rather commonplace lot and many of them ill-preserved.

Budihal hill rock shelters.

(2) BUDIHAL.—A fine specimen of the truly castellated hill with many capital rock shelters near the top where the inhabitants could enjoy themselves in the cool shade. In one of these near the top, I found a long shallow stone trough No. 1828-1 (figured in Plate 8) arranged table fashion between two good rock seats where the women could have sat in great ease, while carrying on their mealing work. They were doubtless very fond of working in company, for a little further down the hill I found a very remarkable little oblong terrace with a flat bare rocky floor where the mealers had evidently been in the habit of working in company, for some 14 or 15 large shallow fairly polished depressions had been worn in the rock. The hollows are from 15 to 20 inches across and nearly circular in shape.

Mealing place.

The women could here have carried on their work in shade from the upper part of the hill till late in the morning and enjoyed a fine and extensive view to the westward. In this place the mealing work must have been carried on in the kneeling or squatting posture.

Of the numerous and varied artifacts found on this most interesting hill the following deserve special attention :—

No. 1778 is a small pestle made of diorite. It has a triangular body.

No. 1797 is a large oval mealing stone made of grey crystalline limestone, a stone not to be found in that neighbourhood and very rarely used by the neolithic people.

No. 1807, a mealing stone of chrome-mica gneiss, rather broken, was apparently a thick oval when complete; used on two faces.

Very little pottery was noticed on the hill and only one fragment was brought away, which was part of a grey earthenware rose vase.

Vidapanakallu Fort hill.

(3) VIDAPANAKALLU FORT HILL (Iddapinkal of Atlas sheet No. 59) on the Anantapur-Bellary high road.—A considerable number of celts, chisels, flakers, etc., were found on the rocky hill rising close to the village. Only No. 1836 deserves special attention because very shapely, the rest are a rather poor lot.

The two granite hills at Vidapanakallu yielded respectively celts and other neolithic implements, but no pottery was obtained from either. The celts, chisels, flakers and other implements found on the Fort or Eastern hill demand no special remarks, but beside them I obtained a good series, of flakes, strike-a-lights, scrapers and cores, mostly of chert, but some of agate and

chalcedony and quartzite, several of which merit attention. No. 1852–2 is a broad-edged scraper of reddish light brown chert.

No. 1852–5 is a circular strike-a-light of chert, deep chocolate and bluey mottle in colour. No. 1852–8 is a small lancet-shaped flake of yellowish agate. No. 1852–13 is a flake scraper of limpid rock crystal with a good bulb of percussion. No. 1852–14 is a small shapely scraper ended flake of pale yellow agate with a bulb of percussion. The flake is figured in Plate 10. Nos. 1852–24 and 25 are dark brown agate cores of 7 and 8 flakes respectively, showing shining surfaces.

The agates of which several of the cores and flakes are made must have been procured from a considerable distance; the valley of the Tungabhadra, the nearest place where agates (out of the Deccan Trap) are procurable, is nearly 60 miles distant; the makers of the flakes and cores must therefore have been at the trouble of fetching them or procuring them by barter.

(4) VIDAPANAKALLU WEST HILL.—A granite hill lying a little distance away from the pointed hill just treated of. Here too a good number of neolithic implements were found together with the only palæolith, No. 1853, I came across in the Anantapur district. See Plate 18. It is made of quartzite and is a squarish oval in shape. Vidapanakallu West hill.

The noticeable finds made here beside the palæolith just referred to are the following :—

No. 1854 is a broad-edged celt of diorite in the third stage showing two joint planes brought into use in the making. No. 1864 is a chisel, of diorite, in which two joint planes have been utilized by the makers. No. 1877 is a slingstone of red chert. No. 1885 is a scraper made of purplish red hæmatite jasper.

(5) VELPUMADUGU (Yellapadugu of Atlas sheet No. 59), an isolated round-topped granite hill about 2 miles east of Vidapanakallu, crowned with a fortification of post-neolithic date. Although a very poor position strategically when compared with the hill sites just described, this hill yielded a good harvest of celts and other neolithic artifacts, of which the following are worth some attention :— Velpumadugu hill.

No. 1948, a small celt of basalt with a pointed butt, a deep cutting edge and one joint plane side, is figured in Plate 18. No. 1953 is a small celt of basalt which shows three joint planes to have been utilised. It had been worked up to stage 3. No. 1970 is a diorite hammer-axe *minus* its butt. It also had been worked up to stage 3. No. 1993 is a thick-bodied diorite chisel with a very short edge transverse to the axial plane. It is figured in Plate 6 and is strikingly unlike any other specimen in the collection.

No. 2018 is a remarkable sharp-edged disc, most probably a hurling stone or slingstone. No. 2032 is a small mealing stone of pink and pale green and yellow pistacite rock, with two faces. No. 2034 is a small oval mealing stone of pale green chrome granite worked on two faces. No. 2034-*a*, figured in Plate 48, is a large oval mealing stone of pale granite, both faces strongly convex, very suitable for use in one of the deep troughs like No. 2788 (Plate 7). Nos. 2035, 2038 and 2039 are slingstones circular in shape—the first made of grey quartzite, the two last of white quartz.

A very interesting series of scrapers, flakes, flake-knives and cores, mostly of agate, but some few of chert, was obtained by me on the Velpumadugu hill and is numbered No. 2040–1 to 2040–33, and of these I would draw attention to the following :— No. 2040–2 is a broad thin leaf-shaped flake of green quartz porphyry, with a very sharp edge. No. 2040–4 is a flake knife of red jasper with a strong cutting edge. No. 2040–7 is a small flake-saw made of agate. No. 2040–11 is a flake scraper made of red-brown chert. No. 2040–33 is a thick-worked flake of brown chert.

The cores Nos. 2040–16 to 32 offer no speciality but are very pretty, so much so that it is strange that they were never drilled and converted into beads, as many of the really shapely ones would have done admirably for such. An interesting specimen of a selected stone is No. 2040-34, a large clavate mass of diorite brought from several miles distance, there being no locality near by from which the specimen could have been obtained. From the nature of the stone and its shape it is a fair inference that the finder brought it in with the intention of making a celt of unusually large size, but for reasons unknown, it never came to be worked.

Riverside site east of Tadpatri.

(6) Old site east of the great temple at Tadpatri on the right bank of the Pennēr about a mile east from it. A considerable tract is thickly covered with broken pottery, much of it of good quality and highly decorated, which must have belonged to superior and well-to-do people. Only one single vessel was met with entire, and it unfortunately broke while being dug out, but was mended and is figured in Plate 48, No. 2055–88.

Of special interest the following deserve attention :—

No. 2055-1 appears to be the side of a small portable hearth such as the Tamil people of the present day call an "adipu". It is red in colour, polished and ornamented a little above the base with a raised fillet of finger-tip impressions. See Plate 30.

No. 2055–8 is the lip of a vase.

No. 2055–14 is part of the side of a vessel with a red round medallion with a fillet of 9 low cones moulded upon it.

No. 2055–15 is a medallion on a fragment of the side of some vessel, with a star pattern inside a broad circular band polished and painted red. Figured in Plate 36.

No. 2055–18 is part of a side of a large melon-shaped bowl with a thin lip and an elaborate pattern traced on it, red, polished.

No. 2055–19 is the side of a large vessel with a good pattern on it, two fillets of right sloping bars and one fillet left sloping bars below. The same may be said of No. 2055–22.

No. 2055–26 is part of the side of a vessel with a striking pattern on it; large, red, polished (Plate 31).

No. 2055–69 is the side of a wide-mouthed lotah with painted brown orange bars vertical and horizontal on a darker ground.

No. 2055–73 is the side of a red bowl painted with vertical pale bars.

No. 2055–76 is a dull red-brown bowl, the side painted with a grating of diagonal pale bars.

Nos. 2055–80 and 81 are parts of the lip of a dish with a wide outside flange.

No. 2055–85 is the shoulder of a vessel with a wavy fillet in a groove below the neck and a big fillet lower down; red, half polished.

No. 2055–86 is the spout-lip of a bowl of rough brown ware.

No. 2055–88 is crateriform bowl with a flat base, of red coarse ware. The bowl which is entire is figured in Plate 48.

The facies of this collection of antique pottery is more modern than that of ordinary neolithic pottery, but no neoliths and no iron implements accompanied it to help in determining its true age.

Equally deserving of attention is No. 2056, a fragment of a well carved sandstone plaque, well curved on both sides. Plate 16.

Selected banded jasper.

No. 2171, a nearly cubical mass of banded black, red and yellow jasper, figured in Plate 20, was found on a pile of loose stones in the space between the rings of a double-ringed Kurumbar ring near to Tadpatri. It is a jasper of the Cuddapah series such as occurs on the hill west of Pulivendla town in Cuddapah district. The rich colour of the jasper is lost in the photo. This fine selected stone was given me by my friend Mr. H. J. LeFanu, I.C.S., retired, who found it himself.

Havaligi hill.

(7) Havaligi hill (*Haveligé hill* of Atlas sheet).—The old site on this isolated granite hill in Gooty taluq 40 miles north-west of Anantapur, yielded a considerable number of celts and other artifacts, amongst which the following are noticeable. No. 2073 is a very tiny square-sided celt of basalt; No. 2079

is a hammer of syenite, square-sided, two of the sides being joint planes. The most interesting finds on the hill belong to the fine series of artifacts of chert and agate, Nos. 2083-1 to 88. No. 2083–7, a perfect flake-knife of red brown chert and No. 2083–8, a perfect flake-knife of brown chert, are figured in Plate 9. Many serrated and biserrated chert flakes were procured here. Exactly for what purpose they were made is problematic, unless indeed they were used for working the patterns on chank shell bangles. One of these, No. 2083-51, is figured in Plate 14. Some are really delicate objects, the preparation of which must have required much time and great care, *e.g.*, No. 2083–30. No. 2083–50*a* is a small graving tool of pinky creamy chert with two sides very carefully worked. Agate flakes were also met with, as well as numerous cores of both chert and agate. Among these latter No. 2083–56, a double core, is noticeable because it has both ends worked scraper fashion; its material is red-brown chert weathered into cacholong in part. I explored the hill on the 28th March 1890.

There are many signs of continued habitation on the middle and eastern parts of the hill, especially the latter, in the shape of mealing places, mostly small and deepish ovals; the shallower hollows are of much larger size superficially.

Kalamedevur hill site.

(8) KALAMEDEVUR HILL.—About 12 miles south-east of Anantapur town, close to the village of Mushturu, on the high road to Cuddapah in an old site at the southern end of the granite hill there occurring, is a neolithic settlement to which an iron age settlement apparently succeeded, traces of the latter being numerous in the shape of black iron slag scattered about the surface on which remain also large quantities of trap fragments, probably the rubbish, of a celt factory. Broken celts were numerous but were not collected; corncrushers and pounders were numerous, but not so mealing stones. Among the finds taken the following were interesting: No. 2160, a shallow mortar made out of a large dioritic trap pebble; No. 2149, a short square-sided chisel.

Much comminuted pottery accompanied the neolithic remains, chiefly of the red and black and salmon-coloured varieties and of excellent quality, but very few pieces were large enough to be worth collecting. Of those taken were No. 2169–1, the lip of a polished black bowl, a good looking vessel; and No. 2169–5, the side of a large red painted chatty with a fillet of finger-tip impressions over a fillet of left-sloping triple square dots or pitlets.

Vajrakarur site.

(9) VAJRAKARUR (Wadjra Karur, Atlas Sheet).—No distinct signs of an old site were visible, but a number of celts, an

axe-hammer, two hammer stones and five mealing stones of granite and gneiss were found close together on the surface of the knoll west of the bungalow. The village lies 27 miles N.W. by N. of Anantapur town and 10 miles S. of Guntakal junction.

The name Vajra means a diamond, but there is no evidence that came to my knowledge that those gems were known in prehistoric times. The word also means a club.

Uravakonda site.

(10) URAVAKONDA.—32 miles N.W. of Anantapur. A neolithic settlement has left traces of itself on the north and west sides of the sharp-pointed hill which must have constituted a very defensible stronghold in the olden time. The finds made were not numerous but included No. 1719, a small celt of basalt in stage 4 and No. 1721, half a polished slickstone of diorite, also No. 1726, a very small oval-worked flake of granite which is figured in Plate 18. Granite was hardly ever used by the neolithic people as they greatly preferred making their arms and implements of basic trap.

Karakumukkala hill.

(11) KARAKUMUKKALA.—A site on a hill top 3½ miles south-south-west of Vidapanakallu, the finds on which are numbered from 1890 to 1934-*c*. A number of celts (10), an adze, 5 chisels, 6 hammers, 13 corncrushers and 6 mealing stones were among the finds, as also several flakes, a slingstone of quartz and the base of the spout of earthenware, No. 1934-*a*, silvery outside.

Guntakal railway junction.

(12) GUNTAKAL RAILWAY JUNCTION.—When stopping at this place in January 1887 I came across a neolithic site which yielded a fair number of celts, etc., which numbered from 2041 to 2055-*a* are in the collection.

Mr. C. Cardew's finds.

My friend, Mr. Cornelius Cardew,[1] with whom I was staying when I found this site, continued the investigation of it with great success after my departure, and many of his finds are now in the Madras Museum and are to be seen in the lower room. A reference to the catalogue of that collection shows them numbered from 1220 to 1268. He had made further excavations and from them obtained an important and very interesting series of iron-age implements. Among his finds was a specially interesting one, a well-made wooden tooth comb which had escaped the greed of the termites because buried in a layer of white ash, a substance strenuously avoided by them at all times. It is with one exception the only neolithic object of wood that I am acquainted with and an object of great interest.

Termites and their destructive work.

The destruction of the immense number of wooden artifacts which must have been in use by the neolithic people, and also

[1] Mr. Cardew was then in charge of the Locomotive Workshops of the Southern Mahratta Railway at Guntakal.

by their palæolithic predecessors, possibly their ancestors, was marvellously complete and is a fact which an archæologist can only mourn over greatly. Had they been preserved we should have been able to form a much better and fuller conception of the state of civilization they had arrived at. That this must have been the case is self-evident when we remember the interesting articles carved out of wood and the variety of examples of the weaving and other industries of the neolithic, bronze and iron-age peoples found in the Swiss lake-dwellings and those of other countries, and the many remarkable finds of dug-out boats, beaver and other traps met with in so many parts of Europe in great bogs or in some cases under blown sands. To the same cause must be attributed the entire absence of remains of huts, houses, palisades and gates to the old fortifications, such as must of necessity have existed in connection with the many settlements of the several old peoples. The voracity of the termites did more to obliterate the works of man than even fire or tempest in many ages. Leather they greedily devour and even attack bone. See Addendum No. XXII.

Guntakal junction site.

Of the many interesting finds I made here the following are specially deserving of notice: No. 2046, a small axe-hammer of diorite, fully worked, with the striking face, ground quite blunt; No. 2048, a small celt worked to the 3rd stage with bevelled sides and three joint planes utilized, the edge broken by use probably; No. 2050-*k*, a core of grey agate which has been used as a strike-a-light, 11 flakes had been struck from it; No. 2054, a round-sided hammer of leptynite; and No. 2055, a cylindrical corncrusher made of pistacite granite.

Bogasamudram site.

(13) Bogasamudram.—Seven miles north of Tadpatri. No very distinct site was here met with, but from the fields to the east of the village a number of chert flakes and cores were obtained of a size considerably larger than generally met with in South India. Of the cores No. 2069 is noteworthy and of the pot fragments No. 2070-*a*, the side of a large red-brown chatty, is elaborately decorated with a raised fillet of impressed left sloping rope barlets and a flat fillet of sunk right sloping barlets. A fine rock crystal bead was also found here which is figured as No. 17 in Plate 17. The cores and flakes were very little weathered and had probably been turned up by the plough not long previously to my visit.

Site north of Havaligi hill.

(14) Hill, north of Havaligi hill.—Beside a few neolithic implements, parts of a polished bowl of light grey earthenware without any pattern on it, numbered 2093-*a*, was the only object of note.

Muchukota flake factory.

(15) Muchukota.—A flake factory existed a little to the north-west of the present village, judging by the many cores of

pisolitic chert lying about, but only few flakes remained; the finds are numbered from 2107 to 2140. I found the factory site in November 1890.

(16) Jambuldinni hill.—A castellated granite hill a little east of the high road to Gooty and 10 miles north of Anantapur town with remains of a small neolithic site on the top and the western face. The finds were a celt, corncrushers, and mealing stones. These are Nos. 2095 to 2099-*b* and many flakes and cores of chert, agate and chalcedony which are numbered 2100 and 2100-1 to 26 and form a very noteworthy series. Several linchets occur on the top. Jambuldinni hill.

(17) Yerragudi hill.—Under a rock shelter near the top of the hill which is a bold rocky one, south of a point on the railway, half way between Gooty and Guntakal junction, I found a celt and some mealing stones, Nos. 1575 to 1578-*a*. Yerragudi hill.

Anantapur town.—At a point a little west of the town, I found a small number of cores, but no flakes, on the site of the police butts. Anantapur town.

A friend Mr. Reginald Ellis, C.E., when on the North-West line met with five objects of interest on a site half a mile west of the railway bridge over the Penner river on the bank.

Of these, three are chert flakes, one of which No. 2070-A is figured in Plate 9. It is slightly serrated and pale chocolate in colour. No. 2070-B is a very pale salmon pink flake; No. 2070-C, a large flake, banded grey chert; No. 2070-D, a small core of crystal; No. 2070-E, a lead coin of the Andhra dynasty. Penner Railway bridge.

CHAPTER XII.

CUDDAPAH DISTRICT.

Only a portion of south of the district was traversed by me after my attention was given to prehistoric research and I came across many fewer old sites and made fewer finds than in the Bellary, Anantapur and Kurnool districts. My geological work lay mainly in the sub-division of the district which forms its southern part and lies much higher than the eastern and northern parts.

Palæolithic sites.

The most interesting part of the country palæolithically is the central part of the Ráyachóti taluq where numerous small thin spreads of lateritic gravel occur, in which quartzite palæoliths are to be found. The knowledge of the presence of these dates from 1864 when they were first found by the late Mr. C. Æ. Oldham of the Geological Survey. I revisited that region in 1891 and obtained various good specimens at different places which are in the collection. No. 2203-A, found on the south-south-west of Sarasvatipalli is a good broad scraper-flake with a conspicuous bulb of percussion. No. 2203-B is a pointed oval broad and shapely palæolith from south of Makrawalpalli, from which locality I procured nine specimens including No. 2203-D, a very shapely narrow double-pointed implement, figured in Plate 2.

No. 2203-E is a small very dark quartzite implement of the axe or Madras type.

No. 2203-F is of the oval type with remarkably sharp edges and rather pointed at both ends. From Chintamreddipalli I obtained No. 2204 a large palæolith, unbroken but much rolled.

From the same locality came No. 2203-I, a large worked flake of dark brown colour rather like an incurved scraper in shape.

No. 2203-K is a pointed oval broad and thin.

Of neolithic artifacts a variety of forms for different uses was collected from several places named below.

Dorigallu.

A little to the southward of Dorigallu in Kadiri taluk of the Cuddapah district I climbed up to the old ruined fort on top of the syenitic Koté Konda. I picked up two neolithic flakes, one of red jasper and the other of grey chert, and with them a bead of black paste slightly striated.

Vemala site.

At Vemala, in Pulivendla taluq, 35 miles west by south of Cuddapah, the former existence of a flake factory site is indicated by the number of cores here found, viz., 23 of chert of many colours and of an unusually "agatey" texture. Only two small

flakes remained with the cores and a couple of strike-a-lights. The cores and flakes are numbered from 2173 to 2196. No. 2197, a celt, was also found here by the road side and to the north.

A small but interesting neolithic site was found at Yellatur, $10\frac{1}{2}$ miles west of Cuddapah, where a few flakers and slickstones were obtained together with a quantity of pottery, mostly red painted and polished. The most noteworthy specimen of earthenware was No. 2203-13, one-third of a small lotah of red rough make which is largely filled with chunam like what is frequently seen in the old rejected chatties of toddy-drawers. This is very interesting evidence of the early existence of the palm juice industry and a proof that the partiality to fermented drinks was not of European introduction but originated in India itself. It is figured in Plate 31 and has come out badly. No. 2203-1 is the lip and neck of a coarse grey chatty bowl, the lip of which is reeded above. This also is figured in Plate 31. No. 2203-4 is part of the lip of a bowl whose lip shows a gable edge; it is of red colour and polished; No. 2203-12 is the lip of a black painted and polished melon-shaped bowl. No. 2203-15-*a*, part of a large-mouthed chatty, red and polished, shows three fillets of barlets and four plain raised fillets. This very noteworthy specimen is figured in Plate 39. **Yellatur site. Early toddy-making.**

From the bank of the Papagni river at Mundlavaripalli in Kadiri taluq, I obtained a large and remarkable series of old pottery well deserving description; but this must be reserved to be given in future bulletins of the Museum when illustrations which are absolutely essential can be provided. The numbers are 2203Z-1 to 2203 Z-67. **Mundlavari palli site.**

Specimens of the shell bangle industry, several of which have carved umbos, *e.g.*, Nos. 2203-*b*, *c* and *d*, were also found here.

Here as elsewhere all the bangles had been rejected probably because broken; they were evidently worn by the women as long as they remained whole, but whether they were broken and cast away purposely when widowhood occurred as is the case with some of the wandering tribes[1] of the present day, it is impossible to say as no evidence on that point was met with.

From a small fortification on the top of the ridge south of Ghattu in Madanapalle taluq, I got a small quantity of fragmentary pottery mostly black and grey in colour and variously decorated. The specimens are Nos. 2203-N to 2203-Y. **Ghattu fort site.**

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1 *E.g.*, the Lambadis or Brinjaris, one of the gipsy tribes.

I found such a stripping of wooden and bone armlets once in the jungle somewhere in the Ceded Districts; the wooden ones were all broken. The whole made a pile 7 or 8 inches high.

CHAPTER XIII.

NORTH ARCOT DISTRICT.

Traces of palæolithic man were found in many parts of this district, especially its eastern taluqs, from which came a very good suite of five palæoliths given me by my friend Mr. H. J. LeFanu, I.C.S., retired, who collected them during his tours when Collector.

Of this series I would draw attention to No. 2204-5, a very unusually pointed weapon, figured in Plate 1. It belongs to the spearhead type.

The implements of this series are all of quartzite.

On the left bank of the Kaveripakkam surplus channel, the Corteliar (river) of Atlas sheet No. 78, opposite to the village of Takkool, 5 miles south-east by east of Arkonam junction, is a circular encampment with a double line of circumvallation which was said by the country people to be the work of the "Kurumbar Rajah," a mythical personage. A good celt was picked up by me from the surface which might have been washed down from some half-destroyed Kurumbar rings if they were of neolithic age. This would easily explain the provenance of the celt, but that age is quite problematic.

Many palæoliths were obtained by me when surveying the eastern edge of the district in 1863 and 1864, but many of these went to the Geological Survey Museum, but eight specimens marked 25 to 32 were presented by me to the Madras Museum and are included in the old collection shown in the ground floor gallery. The late Mr. W. R. Robinson discovered large numbers of them at Kirkumbadi along the Madras Railway in connection with lateritic gravels, but what became of his collection I do not know.

A good series of palæoliths numbered from 51 to 89 and included in the old collection referred to was presented to the Museum by the late Mr. H. R. P. Carter for some time Chief Engineer of the Madras Railway, but no locality was recorded. Most of these, if not all, were, I believe, procured to the west and north-west of Arkonam Junction, where I had previously also found many among lateritic debris, all of which went to the Geological Survey Museum, Calcutta.

CHAPTER XIV.

CHINGLEPUT DISTRICT.[1]

This district is specially interesting as containing the most numerous and important traces of palæolithic man known in Southern India. Neolithic remains are by no means unknown.

Pallavaram site.

The first palæolith discovered in India came from a ballast pit on the Brigade ground at Pallavaram, lying some little distance west of the Madras-Trichinopoly high road. The pit was a very small one, but when I revisited it in 1864 it had been somewhat enlarged and from the debris turned out, I obtained a couple of good oval implements of which one was figured in Plates X and X-*a* of my original paper published in the Madras Journal of Literature and Science, the first implement found being figured in Plates I and I-*a*. My paper bore the title "On the occurrence of Stone Implements in lateritic formations in various parts of the Madras and North Arcot districts."[2] The regular number of the journal only appeared in October 1866, but fifty copies of my paper were struck off the year before and distributed among the leading prehistoric archæologists and attracted immediate and genuine interest in South Indian finds. This interest was greatly increased by my reading in 1868 two further papers. The first, which I read to the Geological Society of London on the 17th June 1868, bore the title "On the distribution of stone implements in Southern India." The second I read to the International Prehistoric Congress at Norwich in August 1868.

Both were very favourably received and fully discussed at the respective meetings, at both of which I exhibited a good series of the palæoliths I had obtained at Pallavaram, the Attrampakkam nullah and elsewhere.

At the Norwich Congress no one took a deeper interest in the Indian palæoliths than the veteran Swedish archæologist,

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[1] This district has also borne the name of Madras district and was known as such at the time at which my paper descriptive of the palæoliths first discovered was published and also later still when my Memoir on the Geology of the Madras district appeared in 1874. Some time afterwards the district reverted to its old name by which it is now known officially.

[2] The great majority of the 27 plates illustrating my paper were drawn by my wife and are excellent likenesses of the implements though very coarsely lithographed. Plates 2 and 2-*a* represent a very typical spearhead.

Professor Nilsson, who specially admired No. 2204-9 of the present collection, but I would not part with it, the very best specimen I ever had, but gave him instead my next best implement, one of a more pointed "Spearhead" type. Later in 1868 the greater part of my collection was distributed for me by Dr. John Evans (now Sir John Evans, K.C.B.) to the leading English prehistoric archæologists including himself, Sir Charles Lyell, Sir John Lubbock,[1] Colonel Lane-Fox,[2] Mr. C. Wickham Flower and Mr. James Wyatt of Bedford. Before returning to India I had the pleasure and advantage of seeing the collections of Sir John Evans, Sir John Lubbock, Colonel Lane-Fox, Mr. C. Wickham Flower and Mr. James Wyatt besides that contained in the Blackmore Museum at Salisbury.

A second important collection of palæoliths and neoliths made in South India was exhibited by me at the International Exhibition in Vienna in 1873. Professor Hochstetter of "Novara" fame and other German savants were very anxious to buy my collection, but I would not part with it and finally presented it to the Geological Survey of India. It went to Calcutta in due course and was later on transferred with the rest of the palæolithic collection to the Indian Museum where prehistoric antiquities were appreciatively treated while the late Mr. Wood Mason was Superintendent, but have since then been grievously neglected as described by Mr. Logan, I.C.S., in his booklet on the "Old Chipped Stones of India" (Calcutta, 1906) as being the greater part "huddled in confusion in a cabinet in the zoological office" having "parted company with their fellows still on view in the Museum." When in Calcutta, acting as Director of the Geological Survey in 1887, I was enabled to recover, by exchange, for more recently acquired South Indian specimens, a few of my old Vienna collection of palæoliths, and also to acquire a variety of other specimens from Jabalpur, as well as some from Banda and three-flint cores from Rohri on the Indus.

Among the Vienna collection specimens regained by exchange were Nos. 2204-7 to 12 of the present collection all of which are deserving of special notice. No. 2204-7 is a very fine specimen of the guillotine sub-type of axe of drab brown quartzite with oblique edge and thick pebble butt, a really formidable weapon in the hand of a strong man. This was one of those collected in 1863 at Attrampakkam by my colleague Mr. (afterwards Dr.) William

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[1] Now Lord Avebury.

[2] Afterwards General Pitt-Rivers, the founder of the splendid Pitt-Rivers Museum at Oxford and a very distinguished writer on ethnographical and anthropological matters. Sir John Evans died in 1908 since the above was written.

King. No. 2204-8 is a straight-edged axe, the first implement found *in situ* and figured in Plate 1. It is very shapely, of pinkish quartzite with a narrow butt end, weathered white; I found it exposed in the low conglomerate cliff, a few yards below the breached bund of the Attrampakkam tank [1]. The beautiful palæolith so much coveted by Professor Nilsson, which I have above referred to, No. 2204-9, is figured in Plate 1; it is a narrow-pointed oval of purplish brown quartzite, with a cutting edge all round so sharp that it could only have been used by having been fitted with some kind of handle or with a very thickly covered hand. No. 2204-10 is a broad oval quartzite palæolith of brown drab colour and well worked and like 2204-9 sharp all round. No. 2204-12 is a discoid palæolith of purplish quartzite of small size, a possible slingstone. Interesting because found far south of the general region of palæoliths, is a small pointed oval one of brown quartzite found with others in lateritic conglomerate at Walajabad and given me by the finder, my friend Professor Henderson of the Christian College. The specimen, which is a little broken, is numbered 2204-13. It was referred to before—page 5.

The old prehistoric collection exhibited in the ground floor gallery contains an instructive series of 25 palæoliths from this district presented by me. The series is numbered from 1 to 25 [2].

A dozen palæoliths from Walajabad presented by Mr. Somer Sampson are also exhibited in the ground floor gallery.

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[1] Details of the geological structure of the country around the Attrampakkam nullah valley and the Corteliar valley are given in my Memoir on the Geology, Vol. X, Chapter V, pp. 27—58, Memoirs, G.S.I.

Many localities for palæoliths were met with in this district as also in the North Arcot District and are there given. See Addendum No. III.

[2] Beside the above 25 I presented the Museum with 23 more fine palæoliths from North Arcot and Nellore districts, and Surapur (Hyderabad State).

CHAPTER XV.

NELLORE DISTRICT.

Quartzite palæoliths were discovered by me in this district in 1867, but none of that date are included in the present collection. Those now exhibited were found by me in 1875 in the upper and middle parts of the valley of the Maneru mostly washed out of lateritic gravels resting on the gneissic rocks. No. 2204-14 is an axe with a pointed butt and sharp all round. Nos. 2204-15 to 20*a* are of broad or narrow oval type and rather rude. Nos. 2204-24 and 25 are worked flakes and 26 a scraper. Remarkable specimens are Nos. 2204-21 and 22, the former a well preserved oval with sharp edge all round, the latter a pointed shapely spear-head with a pebble butt; both of these came from the coarse shingle bed on the higher ground east of Kandukur on the south side of the valley. Both are so slightly weathered that they can only have been exposed a comparatively short time. They are figured in Plate 1.

A series of 14 good palæoliths numbered from 33 to 46 found in the Maneru valley was presented by me to the Museum some years ago and is exhibited as part of the old collection in the ground floor gallery.

A factory for stone wheels for agricultural carts was in full swing in 1875 when visited by me. The wheels were made of granite very carefully quarried at Kuchupudi (at foot of the great Andrakonda hill), 11 miles S. by E. of Podile.

A similar granite wheel factory was in working at Dedarakonda near Darisi about 12 miles north of Podile at the time of my visit to Kuchupudi. Details descriptive of the industry are given in my Memoir on the Geology of the East Coast, in Volume XVI of the Memoirs, G.S.I., pp. 105 and 106.

CHAPTER XVI.

KURNOOL DISTRICT.

This district yielded palæoliths in some number, but only two are in the present collection, the others were mostly sent up to the Geological Survey Museum very shortly after they were found by the late Dr. King and myself in 1865 and 1866 in the valley of the Khundér near Roodrar in lateritic gravels. Some of those that I found in two or three of the valleys northward of Kambam (Cumbum) were very well-shaped quartzite specimens of the pointed oval type, which all went to the Survey Museum.

I showed a fine example of this type to a Yenadi man who had wandered up to my tent door and asked him if the people of his hill tribe were acquainted with such implements and ever used them. In reply, he gave me a look of the most withering contempt and marched off in a stately way, absolutely refusing to come back and answer any more questions. He was evidently much offended by my question, though I had spoken quite kindly to him, but he got immediately on to a very high horse to my great amusement.

Palæoliths from Billasurgam.

The palæoliths now in the collection from this district were found by me; one a little to the south-east of the Billasurgam caves; which is a well-shaped pointed oval implement of gritty quartzite sandstone and had evidently been long exposed to weather action which has affected it greatly. In colour it is drab and it bears the No. 2609. The other No. 2608 is from near Dhone.

In neoliths the district turned out to be rich and still more so in objects of the early iron age.

Patpad.

Western site, the "Cache."

Two very important sites deserving of very special notice were met with and all the finds there made are shown. The first of these sites lies to the north-east of the village of Pātpād or Pātpādu in the Banganapalle State. The second of the sites occurs on the left bank of the Hindri river opposite to the village of Bastipad and is described further on at page 116. The first indications of the presence of prehistorics at Pātpād were noted by me in 1883 in several tiny raingullies in which nice-looking broken pottery was exposed. My head servant dug out some of it and it was so good in quality that I employed him to uncover a considerable piece of ground with no small success as to the variety of the vessels uncovered : unfortunately, however, they had been buried to such small depth that they had suffered greatly from the daily passage over the ground four times a day of hundreds of cattle

going to and from their watering place. From the peculiar mode in which the vessels and other objects occurred here, it appears to me that the only reasonable way to account for the presence of such a quantity of what must have been valuable property to its owners, in such a limited space is to regard the find as a "Cache," or hiding place, from which for reasons unknown, but easily imaginable, the hidden objects were never recovered. In the fields lying to the east of the "Cache" site were found very numerous objects of interest proving that there was there a site of habitation, probably occupied for a long period by the people who had made the cache. Among the great number of articles yielded by the Pātpād site, attention may be drawn to the following objects: No. 2364, a very small thin celt, very probably a child's toy, made of hard speckled brown slate; No. 2365, a slick stone, or slyking stone, which was probably used for smoothing woven material and putting a gloss on its surface. In shape it is a squashed cylinder, to use an unscientific simile; it is made of a black dioritic stone and shows a good amount of polish; but both ends show much bruising as if it had been used as a hammer as well as a smoothing implement. Very noteworthy are Nos. 2367 and 2368, a pestle and mortar, found buried quite close together. The mortar, which is a shallow one, is made of a large pebble of black diorite and the pestle of the same stone. Both are figured in Plate 52.

A large and very interesting series of flakes and worked flakes and many scrapers, also strike-a-lights, is numbered from 2376 to 2474. Pygmy flakes and small serrated and biserrated flakes deserve close attention, as also does the large series of small cores of agate, chert and Lydian stone, numbered from 2475 to 2604. Many are objects of great beauty of colour.

Libation vessels.

Much of the pottery found is of real interest, especially Nos. 2605*a* and 2605*b*, libation vessels of highly polished black ware, of precisely the same character as the fine specimens of this kind found by Mr. Cornelius Cardew at the Guntakal junction site and exhibited in the prehistoric gallery on the ground floor, No. 1231—Plate XXXIII, my Catalogue of Prehistoric Antiquities, 1901. Unfortunately the upper parts of both vases were much broken when found; but they may possibly be reconstructed from the collected fragments by some expert in building up broken vessels with a delicate hand and much patience, though I fear too many pieces are missing.

Ringstands.

If these libation vessels had been ever placed upright before some shrine, they must have been stood upon ringstands of much taller and narrower character than any now in the collection, all of which are suitable only as stands for vessels of more or less broad-based type. Even the tallest of them, No. 2605*a*, would not

have answered for the libation vessels. No. 2605 *aa* is a very small specimen of the finger bowl type and remarkable as being of unpolished pale reddish material with sides rather more rounded than usual. It is well made as to shape but rudely finished. It was badly broken when found and all the fragments could not be collected. No. 2605 *c*, and 2605 *d*, are two good vases of the flower pot type.

Nos. 2605 *l*, *m*, *n*, *o*, *p* and *t* are a series of small lotah-shaped vessels of unpolished red terra-cotta, of which the first four are well preserved, "*p*" has its neck a little broken and "*t*" was found badly broken, but can be built up. The last is certainly handmade judging from the great roughness of the inside. No. 2605 *q* is a small black lotah tall for its size. No. 2605*r* is a mushroom shaped stopper-lid for some small vessel (not found) of pale browny-red—one edge chipped; handmade and rather rude, half polished and of a very rare type. It is figured (upside down) in Plate 38.

No. 2605 *s* is a flattish spindle whorl with an unusually large hole. The whorl was fairly polished when new and is drab in colour. *Conf.* with the Rupavati specimen No. 3423 f.

Patpad east site. "Milk bowl."

The most interesting and remarkable vessel in the collection is the large bowl with a prominent spout lip No. 2605-22 which I found at a spot several hundred yards east of the "Cache" ground. Fortunately I was able to recover all but two small fragments of the many into which the bowl had been broken, and it was cleverly built up by my young friend and assistant Mr. R. F. Carey of Yercaud. It is unquestionably one of the most valuable objects in the prehistoric collections in the Madras Museum. No vessel of similar character is to be seen among the pottery objects found in any other part of India and now shown in the Museum. It is practically unique, as only two or three fragments of this type occur among the other Pātpād finds and a solitary sherd showing the peculiar excurved lip No. 2258-49 came from the old pottery site at Bastipad also in the Kurnool country. The specimen is figured in Plate 26 of the present work. The shape of the bowl suggests its having been used for dairy purposes, an idea which may very likely be a true one.

The bowl is red in colour and painted with faint purplish stripes near the spout lip; and similar purplish stripes may be seen on the bent lip fragments Nos. 2605-23 and 24.

In several of the vessels unearthed at the "Cache" iron arrow-heads were found, Nos. 2605-61 to 64. See Plate 49.

Cores and flakes.

In several of the bowls also lay cores of chert which however were not of any special character; but like the great majority of their kind found in the site, they were of small size. No extra

large flakes of the Rohri type (see No. 4054 figured in Plate 52) were found at Pātpād! May it be inferred from this fact that the people who were settled there, or near by, and who made the "Cache," did not shave? or only that their razors have been lost.

The use of small flakes.

The small flakes struck off the cores may have been used for many purposes, *e.g.*, the pointed ones would have made good piercers, drill heads, tattooing points and lancets.

No. 2376 is a worked flake of peculiar shape closely resembling a halbert head in outline but very thick. It is made of chert, but it is hard to infer from its shape for what special purpose it was manufactured.

Iron weapons.

To return to the iron implements: the arrow-heads are of two types: (1) barbed and tanged, (2) leaf-shaped; they bear Nos. 2605-61 to 2605-64. Among the small iron implements in the collection, Nos. 2605-65 and 2605-66 deserve attention, the former being a small spud head and the latter a small nail trimmer of a shape I have seen in use at the present day; both are figured in Plate 49. No. 2605-67 is the lower end of a javelin head with a strong tang. No 2605-68 is a very short two-edged sword blade. All the iron implements were largely oxidized when found.

Finds in the "Cache" and eastern site.

Among the miscellaneous objects from the "Cache" and the site east of it, the following should be noted: No. 2605-1 a small disc of indurated ashrock; No. 2605-2, a slingstone of chert identical in shape and similar in size to slingstones found in ancient British camps on the Cotswold hills which I have in my English Collection. These latter were given me by my friend Mr. Cornelius Cardew, who found them himself, and with them some excellent specimens of flint arrow-heads, both barbed and leaf-shaped. Only one positive and two or three doubtful chipped stone arrow-heads have so far as I know been found anywhere in India— a remarkable fact considering what shapely scrapers and flakes and pygmy flakes were largely made by chipping flakes of chert and agate. The subject will be found fully discussed at page 21 when treating of the arms and tools of the neolithic people, and will be again dealt with further on.

No. 2605-6 is an incurved scraper of chert, a form of implement which is by no means common in South India.

No. 2605-20 is a scraper made by grinding to a sharp edge a valve of a medium-sized thick-shelled unio.

A unique object deserving notice is No. 2605-32 which is half of a very thick lens of red-polished pottery--which may have served as a lid to some bottle-necked vessel. A figure of it is given in Plate 35.

The second important prehistoric site in the district occurs as already mentioned on the left bank of the Hindri in the Ramallakot taluq opposite the village of Bastipad.[1] The most interesting of the finds made here were of pottery, unfortunately mostly much broken by the ploughing up of the fields which had come to occupy the old site in which the vessels had been buried. Of the pottery objects here found the most noteworthy are mentioned below. No. 2258–49 is apparently the middle division of a double portable hearth or "adipu" of coarse red ware, the side walls and base having been lost. I judge it to be such from a more modern "adipu" I dug out on the old Buddhist mounds at Gudivada in the Kistna district. A striking bowl is No. 2258–55 figured in Plate 32. The sloping outer side of the thick rounded lip is pitted with small oblong pits vertically arranged. No. 2258–73 is a fragment of the side of a bowl of grey colour festooned with a well moulded fillet. It is figured in Plate 36. No. 2258–75, is the side of a vessel of polished black ware showing a shallow groove and below it a fillet of impressed cones laid horizontally which is a quite unique decoration. It should have been figured but was accidentally overlooked and so also was No. 2258–80, the side of a large heavy vessel with smooth thick side and red inside. Bastipad

On the top of the bold and steep Kappatralla hill, in Pattikonda taluq, I came across several polishing grooves in excellent preservation. I tried to get one chiselled out but the local stone cutters positively refused to undertake the job, probably for some superstitious reason, though I offered them high pay for the work. The villagers held a conference on the subject and decided they knew nothing about the use or age of the grooves in question. Kappatralla hill polishing grooves.

At the old neolithic site at Paspalla, 9 miles west of the Patpad Cache, I found an excellent incurved scraper of chert, figured in Plate 15, No. 2606-1. It has an admirable scraping edge. With it I got two remarkable wedge-shaped selected stones Nos. 2606–11 and 12 of dark and grey quartzite respectively; the first formed by five, the latter by six joint planes. No. 2606–12 is figured in Plate 52. Paspalla site.

A very remarkable and unique chatty vase (No. 2335 *a*) was found by myself in January 1889 when visiting the twin hills known as the Tsanugondla[2] (Sannugundla) or "Pap-hills" in company with my friend Mr. C. Michie Smith, till lately Government Astronomer, Madras. It was found in the old fort on the southern hill. Tsanugondla incised vase.

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[1] 12 miles south-west by south of Kurnool town.

[2] In Pattikonda taluq, a little south of the Guntakal-Bezwada Branch of the Madras and Southern Mahratta Railway.

Its speciality is that it is decorated with shallow incised (scratched) lines, double or triple as the case may be, on the shoulders, with a broad fillet of crimping a little below the neck which is plain with a narrow flat lip. The vase was unluckily badly broken when found and so many pieces were not to be recovered, though we both hunted for them most carefully, that it cannot be built up and remains in a very imperfect condition. The apparent existence of a handle in Plate 57 is an ocular deception due to the peculiar mode in which the fracture had taken place.

With the vase were a small number of neolithic flakes of agate, chert and chalcedony, also a core of brown agate and one of a prismatic quartz crystal, both very bright.

The Cave Groups.

Two groups of caves of very considerable interest exist in the Kurnool District. The Billa Surgam caves in the Nandyal taluq and the Yerra Zari Gabbi 7 miles to the south-west of the first in the Banganapalle State.

Billa Surgam caves.

The Billa Surgam group was first made known to the scientific world by Captain Newbold, F.R.S., who discovered the caves in the forties of last century and found them to be ossiferous and made a collection of the fossil bones which however was never described and was subsequently lost. The caves were revisited in 1884 and explored by my son Lieutenant (now Lieut.-Colonel) Foote, R.A., and myself. By far the greater part of the excavation of the several passages was carried out by him in my absence on other duty and a large collection of bones made and sent up to Calcutta and there finally dealt with by Mr. Lydekker. They were described by him in part 2 of Vol. IV, Series X of the Palæontologia Indica (1886).

Yerra Zari Gabbi caves.

The Yerra Zari caves yielded no fossil bones, though very considerable excavations were carried on there in the hope of reaching a stalagmite floor under which fossil bones might be concealed. No stalagmite floor was met with, however. No paintings or drawings of any kind were found in either group of caves, though the several passages were very carefully examined. The rather dark passages were examined with lighted magnesium wire, but that revealed no attempts at decoration. The prehistoric people had in all probability little artistic taste, such as is still possessed by the Bushmen of South Africa, and was conspicuously shown by the palæolithic and neolithic inhabitants of many of the caves in the valley of the Dordogne in Southern France, amongst which those of Combarelles and LaMouthe are the most remarkable for the great series of pictures they show. Some of the sea cliffs at

Sydney Harbour were also very highly adorned by the Australians with clever paintings. See Addendum No. XII.

Mons. E. Cartailhac and the Abbé Breuil have lately added to the number of decorated caves known in the Pyrenees. Of these the Gargas cave shows many paintings of animals, *e.g.*, elephant, bison and horse, which resemble other European examples of palæolithic art, as also the paintings of the South African Bushmen and some Australian tribes, the former of which especially are remarkable in their boldness and clever representation of hunting scenes. The Bushmen caves on Mount Selozwana show highly realistic figures of giraffies, guinea-fowls and flying ants[1].

That the Indian peoples of palæolithic and neolithic times did occasionally make drawings or engravings on bone for special purposes seems however more than probable because implements suitable for the preparations of such drawings have been found and some are in the collection, *e.g.*, the chert "burin" No. 4055 (figured in Plate 12) which was found near Jabalpore and came into my possession by exchange. In type it is identical with a flint burin from Les Eyzies in my private collection, but the latter is larger.

Yerra Zari Gabbi is largely tenanted by bats of a large species. On our first entering they flew out in hundreds with such a rush that our candles were blown out. Several cart loads of their guano are collected and carried away annually.

The Billa Surgam caves are inhabited by many porcupines which have knawed bones of other and larger animals into many remarkable shapes.

The existence of a large cave to the south-east of Badvail close to the ghatroad crossing into Nellore district was unknown to me till long after the Billa Surgam cave work was finished and I had left that part of country, or I should certainly have explored it.

Itikala drill cores.

At Itikala, in Koilkuntla taluq, I came across two very large drill cores which from their size must have been made when drilling the axle holes of cart wheels made of grey limestone. I met with several agricultural carts fitted with such limestone wheels. In shape and size they closely resembled the granite wheels made at Kuchupudi in Nellore district.

Stone hammer in Yerra Zari Gabbi ravine.

Half a round hammer of polished trap was found by me in the Yerra Zari Gabbi ravine south of the cave mouth; it is much weathered and bears the No. 2607.

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[1] See McNeill and Chubb's paper on "Some Aspects of the Matopos" in Vol. VIII of the Proceedings of the Rhodesia Scientific Association.

CHAPTER XVII.

GUNTUR DISTRICT.

The finds made in this district (which has been lately constructed out of the southern half of the old Kistna district and the northern taluqs of the Nellore district) were very few in number.

Mace-head.

Interesting neolithic specimens are Nos. 2204–27 and 28, the former half a mace-head of granulite the drilling of which had not been completed. It was found at Vemavaram, 13 miles north-east of Ongole.

Drill core.

The other is an excellent drill core of red brown quartzite found at Feringi Dibba at foot of a ruined shrine and associated with apparently prehistoric broken pottery.

No. 2612, an adze? made of mottled brown Gondwana sandstone, was found at Vadamanu. The cutting edge is wanting.

Palæoliths.

The seven palæoliths included in the Guntūr district list of finds demand no further special notice than to point out the rudeness and clumsiness of the specimens found in the high level gravels at Ippatam, near the south end of the great railway bridge over the Kistna.

CHAPTER XVIII.

KISTNA DISTRICT.

Compared with the number of finds made in many other districts to the south and south-west, the yield of prehistoric objects in the Kistna district was very meagre, but no reason for this was apparent from its physiography, unless it be that so large a proportion of its area is formed of the alluvium of the river delta, which has covered up the older land surface occupied by the palæolithic and neolithic peoples. Prehistoric pottery was as rare as prehistoric stone implements. None of the former came in my way, but a friend, the Rev. Mr. Stone of the Church Mission Society, gave me a crateriform bowl of coarse yellowish earthenware of a type of which he found many examples when digging the foundations of his new church at Raghavapuram in the Nandigama taluq. They were all of a pale yellowish-brown colour with flat bases. The type, which is figured in Plate 48, is a widely distributed one, but used only, as far as my observation goes, for pottery of very inferior quality, which very possibly served as the food vessels of the poorer people. The specimen actually figured (No. 2055-88) was found at Tadpatri in Anantapur district (*vide* p. 100).

Raghavapuram.

A broad oval palæolith (No. 2617) of brown quartzite was found by me on a high level gravel on the left bank of the Kistna at Oostapalli, 10 miles west of Nandigama, the most westerly taluq town.

Oostapalli palæolith.

A great tumulus of undetermined age lies a little to the south of Nandigama. It had not been opened at the time of my visit in 1884. To have attempted to open it would have involved a considerably longer time than I could afford on my way to the Singareni coal field, whither I had instructions to proceed with expedition. The Archæological Survey has presumably examined it already. If not, the tumulus ought to be taken in hand at a very early date, lest it should be plundered by marauding explorers.

Nandigama tumulus.

West of Gudivada, an important town in the Kistna district, is a great area covered by mounds formed of the ruins of an old Buddhist town, very largely mixed with great quantities of old pottery showing marked differences from much of the ware made in the preceding iron age. With this pottery were found a number of interesting objects by Mr. Robert Sewell, when Head Assistant Collector at Bezwada in the seventies of last century. He very kindly gave me several of his finds, which I included in my collection, and they became thus the property of the Madras Museum when I sold it to the Madras Government. They are all mentioned in the *Catalogue raisonné* of the collection.

CHAPTER XIX.

HYDERABAD STATE.

Yeddihalli palæolith.

Remains of palæolithic man have been found in various parts of the State and mostly in connection with formations of recent age geologically considered, but of great antiquity historically regarded; but only one is represented in the present collection, and this is a specimen of much interest both from the unusual material it is made of and from the locality of occurrence and position in which it was found. It is a broad pointed oval in shape and made of hard siliceous limestone of grey colour. I found it among the debris of the limestone cliff capped by the basement floor of the Deccan trap series at Yeddihalli $14\frac{1}{2}$ miles west of Surapur.

The provenance of the limestone, of which the specimen was made, was not ascertainable, but it was a stone different from the local one. The implement, which is a well made one, is figured in Plate 2 and bears the No. 2894.

Neoliths were met with in large numbers at the several localities enumerated below, and the important or specially interesting finds have attention drawn to them.

Bellumur Rayan Gudda neolithic site.

As the numbering of the specimens follows the order in which I made the finds, it will be most convenient to follow it. One of the most interesting sites occurs on the southern side of the fortified hill of Bellumur Rayan Gudda 4 miles north-west of Lingsugur town in the Raichur Doab. From the nature of the finds here made and especially the very archaic character of the pottery I think it safe to assume that the site is a purely neolithic one without any admixture of traces of the early iron age artifacts. An interesting scraper made of yellow chert is No. 2626; it is thin at its bulb end and thick at its distal end. The pottery remaining mostly in a highly comminuted state is chiefly grey in colour and of poor quality. Two specimens I picked up are of very special interest however; they are Nos. 2633-1 and 2633-2 both of which I have figured in Plate 60.

The former specimen represents the skull of a bull, the "boukranion" of the Greeks. It is made of grey earthenware and was very probably one of a pair attached to a large vase as ears or side ornaments. That the vase was a very large one may be inferred from the back of the skull showing no perceptible curvature, unless indeed it be part of a plaque.

No. 2633-2, if made of stone instead of pottery, would unquestionably be regarded as a belted hammer from its shape which is quite that of such a hammer; but such an article of earthenware would be quite useless and it must evidently have been constructed for some other purpose, but what? Was it meant to be a stopper for bottles of different sizes or may it have been intended for a net sinker?

The next site of interest occurs about 6 miles further to the eastward close to and around the present village of Kotegallu on the road from Lingsugur to Raichur. The most important part of the neolithic settlement lay to the west of the existing village and many objects were turned up during the ploughing of the fields and it was while walking over them that I picked up a very perfect celt, No. 2634, figured in Plate 3. The celt is in such excellent preservation that it could only have been exposed for a very short time. It retains its original polish except where encrusted and its very sharp edge is unchipped. The material is a black basic trap. Kotegallu.

Other celts Nos. 2635 to 2638, though not in such excellent preservation, are good and noteworthy.

A capital series of flakes of chert and agate, several of them serrated, one biserrate, and a small scraper of white chalcedony, further rewarded my hunting, as did also part of a large grey bowl, the lip of which is decorated with a raised twitch fillet on top. It is figured in Plate 33, No. 2639-49.

The neolithic people left many traces of their having lived there.

At Naulukal "the Peacock rock" 10 miles further east they must have occupied the great rock, for on its summit I got a number of flakes of interest, but only a couple of sherds worth noticing, No. 2705-1, the lip of a chatty of coarse earthenware, grey outside and black inside with a fillet of finger tip marks on the edge, and No. 2705-2, the side of a small chatty of brown polished earthernware painted. Naulukal.

I noticed an immense quantity of old pottery at the western foot of the rock, but had no opportunity of overhauling it much though I should have liked to have done so.

From a site close to Alisandi hill, about further 10 miles east still, I procured a series of flakes of chert of very various colours showing that their makers must have had an eye for colour and have taken some trouble to gratify that taste, as chert of that kind was procurable only from the neighbourhood of Kurnool or from Cuddapah district. With these flakes was a very pretty little pendant of white chert worked into something like a crescent with the hole for suspension at the upper side of the curve. This is figured in Plate 17, and bears the No. 50. Alisandi hill.

Anandagal. From here I moved west again and just 4 miles south-west by west of Wuttugallu and 11¾ miles east by south of Lingsugur, I came upon an important neolithic site on the fort crowned rock of Anandagal on which and from the fields to the west of which I procured a very good series of celts of basaltic trap, Nos. 2710 to 2718, mostly well shaped and well preserved, also the front half of a very good chisel, No. 2719, with an elliptical edge. No. 2724 is a remarkably fine lancet-shaped flake of yellowish brown chert, which I have figured in Plate 9. From its good shape and sharpness it would have been quite usable as a true lancet. Nos. 2725–2727 are also deserving of special attention. They are shapely flakes.

Of very considerable interest is the series of flakes of chert, agate and chalcedony here found, many of which are serrated and many show very pretty colours. Unfortunately most are more or less broken.

Of the pottery found in this site only a solitary specimen is worthy of special notice. This is No. 2639–50, the side of a large chatty of polished red ware with a raised fillet of vertical rope markings. Much of this red earthenware lay about the fields, but was too comminuted to be instructive.

Wuttugallu. Proceeding eastward some 4 miles from Kotegallu, a fortified hill named Wuttugallu lies south of the high road which it commands and here also the fields south of the hill show abundant signs of a neolithic site of much interest, many of the objects found being of very exceptional beauty. Nos. 2640 to 2649 and 2650 to 2654 constitute a fine series of celts. No. 2655 is an adze of true Polynesian type and worthy of special attention, though unfortunately much broken. If the broken parts be restored in strict conformity with the lines as indicated they show that the implement most closely resembles a form exceedingly favoured by the South Sea islanders as shown in various books treating of the Pacific Ocean and its islands. No. 2663 is a very remarkable flake of chert $3\frac{3}{16}$ inches long although the proximal end is missing. It is very delicately serrated on both sides and forms the most beautiful saw flake I am acquainted with anywhere. It is figured in Plate 9. No. 2662 is a capital flake scraper of the long narrow type. No. 2657 is a chisel with a thick body, a pointed butt and an elliptical edge. See Plate No. 6.

The pottery found here was of no very great interest and not much in quantity. No. 2668-1, the right thigh of a human figurine greyish white in colour, is the only piece worth naming.

The line of country between Lingsugur and Raichur seems to have been in great favour with the neolithic people, for they occupied many suitable spots along it. It was probably the route

between the two great strongholds now known as Mudgal and Raichur, both typical castellated hills.

At Halapur where I halted between Wuttugallu and Maski I got a very good little celt unusually thin but with a broad square edge, No. 2708. It had been ploughed up recently. Halapur.

Another important old site not so characteristically neolithic as the last three just described, occurs at Maski 16 miles south-east by south of Lingsugur on the right bank of the local river, a tributary of the Tungabhadra. Among the objects here found the following are noteworthy: No. 2735, a pivot stone of diorite of which half remains; No. 2736, a hone of grey banded limestone which has been worn out by much use; No. 2738, part of a small grinding slab of grey brown quartzite, both faces used and worn slightly hollow: it was very likely used for grinding reddle stones such as No. 2740 to produce rouge or other red pigment and had been used as a palette. Of very special interest is No. 2739, one end of a bone rod on each of the four sides of which concentric rings have been carved. Eight rings in all remain, of which three are on the side shown in Plate 47. The bone has been but little weathered, so must evidently have been buried till very shortly before I found it and not exposed to the sun which has a most destructive effect on bone. The rod was very probably a priestly conjuring staff. A goodly number of chert flakes, both serrate and biserrate, was also obtained at Maski as well as 12 cores of agate and white chert. Maski.

Maski was the first prehistoric site which yielded bangles and other ornaments made of shell. In the case of the bangles the shell worked up was the common chank, Mazza rapa of conchologists. The examples of this shell from the gulf of Mannar are much larger and finer than those met with near Bet Island, Kathiawar.

Of the shell ornaments No. 2783-1 makes a pretty pendant, its front side having been ground away. It is figured in Plate 41. No. 2783-2 is a small unfinished bead made of a small cowry shell. No. 2783-3, a small disc, $\frac{3}{4}''$ in diameter, can hardly be reckoned an ornament. It may possibly be a currency token such as is used in the Caroline islands and other groups in the Western Pacific, cut out of large shells there found. It is also shown in Plate 41. One side is a little broken.

Among the shell bangles a number show decorative carvings of various devices on their backs, *e.g.*, No. 2783-25 to 35. No. 2783–63 to 85 are specimens illustrative of the rejects of the bangle-making industry.

A good deal of old pottery was found on the Maski site and some of it is of marked interest, *e.g.*, No. 2783–86, which is the right jamb of the door of the small hut-urn referred to in the section on Prehistoric Pottery (page 35). No. 2783–87, the figurine of an animal, is probably a votive offering. It may represent a bull or a horse, but is too vaguely formed to be really identifiable. I am indebted to my friend and quondam colleague Mr. Philip Lake for this find. No. 2783–88 is the wide spout of a vessel of a coarse grey rough earthenware. No. 2783–89 is also a spout, but of red smooth ware and elbowed in shape.

Rawalkonda hill.

Rawalkonda (Rawdukonda of Atlas sheet) is an old site at the foot of the east side of the high rocky hill of that name in Sindunur taluq and 6 miles south of Sindunur. The hill must doubtless have been a great stronghold but here, as at Bellumur Rayan Gudda and Wuttugallu, only very faint indications of habitations remained on the surface of the top and no excavation was attempted for want of time. The principal find made here is the deep granite mealing trough, No. 2788, which is figured in Plate 7. I found it at the foot of the hill at the extreme south-east corner. It was buried so deeply that only a couple of inches of the exposed end were visible, but luckily a scrap of the curve cast a shadow which showed, so I had it dug up at once and was well rewarded. Of great interest is the rich series of flakes of chert, agate and chalcedony here found, Nos. 2789 to 2872 and several are deserving of very special notice. The following flakes and pygmy flakes are deserving of attention: No. 2790, a saw of pale chocolate chert; No. 2792, a pygmy flake saw, entire, of dull brown chert; No. 2795, an agate flake brown mottled in colour shaped like an arrowhead—but its being a truly worked head is doubtful; No. 2806, a very delicate flake of dull red chert; No. 2809 is a very small sharp edged lancet of red chert; and No. 2826 a very delicate flake knife of pale motted brown chert with 2 cutting edges. Very little pottery was seen at Rawalkonda and the only piece of real interest taken was the lip of a broad excurved large bowl of pale red polished earthenware with three fillets of impressed dots round the top. A small number of fragments of chank shell bangle were found here, but none with patterns of any merit.

Two specimens of pottery are worth attention, and are numbered 2872-1 and 2. No. 1 appears to be the spout of a vessel. No. 2 is part of the broad excurved lip of a large bowl on the top of which are three impressed triple rings of dots on pale red polished ware. The specimen is figured in Plate 34.

A small settlement of the neolithic folk had its site on the western side of the Goburkallu, a moderate sized hill four miles south by east of Rawalkonda. Among the finds were two celts Nos. 2875 and 2876. No. 2877 is a marble, a child's toy, made of white limestone apparently. Goburkallu.

Several noticeable pieces of pottery came from the small site in the recess of the hill on its western side : they are No. 2877-1, the wide mouth of a bright red, half rough vase of a bold pattern. No. 2877-2 is part of the lip of a bowl of grey rough earthenware. The top is marked with thumb and finger twitches in which the impressions of a long thumb nail are very conspicuous. No. 2877-3 is the lip of a bowl of black and red ware with small thumb and finger markings. No 2877-4 is the side of a grey, half rough chatty with two fillets of impressed cord marks. No. 2877-5 is the side of a chatty with an impressed cloven pattern on dark ware. No. 2877-6 is a curious thin black rough cake of earthenware dished on one side. It is of no possible use, but may have been made as a child's toy.

Site on left bank of the Tungabhadra.

An old site on the left bank of the Tungabhadra opposite to the town of Hampasagara in Bellary district shows as a bed of old and mostly broken pottery capping the regular alluvial bank of the river for several hundred yards. I could not attempt any excavation here and the fallen parts of the pottery bed yielded but little that was worth collecting on the occasion of my first visit, only some six specimens having attracted my eye sufficiently to induce me to lift them up from the shingle spread at foot of the alluvial cliff. These six are the following : No. 2886-1, the mouth and neck of a bottle of pale red unpolished earthenware ; No. 2886-2, a quarter of an elegant little vase of half polished red ware which will be found figured in Plate 39 ; No. 2886-3, half a small bowl of rough red ware with a side flange; No. 2886-4, the side and base (nearly half) of a red and black half polished medium sized bowl with a rounded side.

Objects washed out of ruined graves.

From a group of old graves lying some distance to the north-east of the site above described I obtained several interesting objects which had been exposed by some high flood of the river which not long before tore up the surface of two or three graves. I may name No. 2886-6, a bowl of the finger bowl type, red in colour painted with a trellis pattern in lighter red. It was broken, but I secured the whole and have built it up. The surface had been a good deal injured by the flood action. It is figured in Plate 53. From another torn up grave close by, I rescued the remains of a large and remarkable four-footed vessel, No. 2886-7, which differs from every other legged vessel that I have seen in having

Four-footed vessel.

the long diameter of the oval body placed in a horizontal position instead of a vertical one. The feet of the vessel are columnar and open at their base, the ends of the oval body projecting beyond them at either end. The opening of the vessel, which is on the back, is provided with a lid which appears to have been prepared by cutting out, while the clay was still soft, the upper side of the body chamber. On the top of the lid which is broadly oval is a crest too low to make a convenient handle. The walls of the vessel are thick and heavy making its reconstruction very difficult, and it fell to pieces several times after being built up. In its general appearance it strongly resembles a grotesque elephant with a very small head, which was broken off and not found[1].

Nothing remained in the vessel when found and it is impossible to say whether it had been filled with anything or not. Excepting the head and a few small fragments the whole of the pot was secured. See Addendum No. X.

Part of a red polished bowl with a side flange was found close by. It bears the No. 2886-5.

Indications of the existence of another small settlement were noted westward of the first trans-Tungabhadra site near to the existing village of Tiguri, but no object of special interest was there obtained.

Beside the several sites above described, a number of interesting solitary finds have to be named, which are as follows :—

At the tree station on Buntanur hill, 23 miles west of Surapur,—a good broad leaf-shaped flake of chert apparently of neolithic age, No. 2895.

Honhalli, 6½ miles north by east of Lingsugur, a neolithic chopper of trap, the back formed by a well-marked joint plane, No. 2619.

Hill south-west of Kautala (Civital of Atlas sheet 58) a very perfect greenish coloured celt, No. 2706, and a nearly cylindrical mealing stone of red granite, No. 2706-*a*.

Kerehal—No. 2873, a very small and shallow muller-mortar or goldsmith's anvil of diorite.

Jantakallu fort—much comminuted antique pottery; a good cylindrical bead of lapis lazuli, much weathered, but recovering its colour when wetted only to lose it on drying again.

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[1] Every known cement was tried and failed and the building up was only accomplished by Mr. R. F. Carey, by sewing the fragments together with copper wire, in itself a very difficult and tedious piece of work, rendered much more so by the want of several small but much required pieces.

* Jirlacherru—a cylinder of Upper Gondwana conglomerate, No. 2891; a pottery site of large extent which was very cursorily inspected and could not be revisited.

* Matur, a broken celt, No. 2889.

* Byavaram, the cutting end of a celt, No. 2890.

* Harur, ½ of a large celt, No. 2892.

* Mustellapalle—a celt, No. 2893.

* Poolloygooda—a low rocky hill 21 miles east by south of Bonagiri, on which are a number of celt-polishing grooves in excellent preservation, because on the slope and not on the level as at Holalagondi, Bellary district. Being on the slope they did not catch and retain rain water to injure their polished surface.

Pottery from the copper mines.

The latest acquisition from the Hyderabad State is an interesting piece of pottery found in one of the abandoned old copper mines on the left bank of the Kistna river near the centre of the south to north reach of the river south of Muktiala in the Kistna district. The fragment No. 2895-*A* shows the side and spout of a medium-sized vessel of unique shape, the short spout being supported as it were by a rather deep buttress. The vessel is made of polished earthenware dark red in colour.

With it came some seven articles of earthenware, bowls and bowl dishes of iron age types, and a large iron "gad" much oxidized. In addition to these, Mr. Cass, the Mining Expert, sent two specimens of malachite and azurite schist, the ores that had been mined there. The old mines lie a little westward of my old working ground when surveying the north of Nellore and the south of the Kistna district (now the Guntur district) in 1876 and 1877.

NOTE.—For exact location of the small sites (all marked with an asterisk) named above, see Addendum No. XVII.

CHAPTER XX.

DHARWAR DISTRICT.

In the alluvial gravels of the Bennihalla, an affluent of the Malprabha from the south, many fine palæoliths were found by me in a hard kankar-cemented shingle bed, three miles above the junction with the Malprabha. They were very firmly cemented, and it required much careful labour to extract them unbroken. None of these are included in the present collection, having all been sent to the Geological Survey Museum in 1873 and fully described in my memoir on the Geology of the South Mahratta Country, Volume XII, Memoirs, Geological Survey of India.

CHAPTER XXI.

BIJAPUR DISTRICT.[1]

The only specimens of palæolithic age from this region which had remained in my collection when I parted with it to the Government of Madras were Nos. 2896, 2897, 2898 and 2898-A, all of quartzite. Of these four, No. 2898-A is the most noteworthy, being a very large pointed oval palæolith of drab quartzite shaped by large flakings across the lamination of the material. It is figured in Plate 2 and was obtained by me in 1873 from a coarse shingle bed in the old alluvium of the Malprabha river at Kaira. No. 2896 is a broad-pointed oval palæolith found by me at Kaira from the same shingle bed, which yielded a fine series of specimens. From Madagi on the north side of the Malprabha I procured a very small pale brown oblong scraper, No. 2897. The above were all included in the collection I exhibited at the great Vienna Exhibition in 1873 and afterwards presented to the Museum of the Geological Survey of India, but I recovered No. 2897 in 1887 by exchange.

The palæoliths obtained from the shingle beds in the alluvium of the Malprabha were in all probability washed down from higher levels lying northward of the quartzite ridge which forms the southern boundary of the Kaladghi series as well as its base. To the northward of the quartzite ridge are indications of the existence of a lake or swamp, which I will call the Badami lake which gave rise to the quasi-lateritic deposits in which the palæoliths were buried and from which they were subsequently washed out by atmospheric agencies and carried down into the younger alluvia of the rivers Malprabha and Bennihalla. That the palæoliths found in these alluvia had been derived from sources which were not far distant is proved by the very small traces of attrition they show.

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[1] Vide Memoirs, Geological Survey of India, Volume XII. Since the publication of that Memoir the district, which was then known as the Kaladghi district has been renamed the Bijapur district and the head-quarters of the Collector have been transferred from Kaladghi town to Bijapur city, the old capital of the Muhammadan Kingdom, which flourished in the fifteenth and sixteenth centuries.

In the region whence the palæoliths were washed down there appears to have been a centre of residence of the implement-makers, as impiements of many sorts "axes, spear-heads and scrapers" occur in large number scattered over the country ; but no distinct site of manufacture was observed by me.

My use of the words above quoted from my original memoir has been criticized by a late writer on objects of palæolithic age, Mr. A. C. Logan, I.C.S., in a little book published in 1906, "The Old Chipped Stones of India" in which he says (p. 23) "the terms 'axe' and 'spear-head' are not applicable to any true palæolith ; and as no implements answering to these descriptions occur among the large collection from this region in the Museum (Calcutta), it may be assumed that Mr. Foote according to the fashion of the time, used these terms loosely to describe the heavy choppers and pointed ovals, both used without any hafting to wood, which are characteristic forms of the oldest Indian types." I do not accept Mr. Logan's criticism on this point any more than various other unfavourable comments on other parts of my work which I have noticed in his booklet. I am distinctly ot opinion that many of the palæoliths could not have been used for any purposes unless hafted, for they were made much too sharp edged to have been used in the unprotected hand, and the palæolithic people, savages though they may have been, were assuredly intelligent enough to invent for their axes and choppers handles and shafts for their sharp-pointed implements to convert them into spears. The mere use of clubs must have taught them the advantages of having a long swing to their most formidable and therefore most valuable weapons, and very brief experience must have shown them the great gain of being able to avoid close hand-to-hand contests with their human enemies and much more so with the huge wild beasts they had to encounter from time to time. See *ante* pages 12 and 13 and also addendum No. IV.

I have not set eyes upon the Calcutta specimens since 1887, so cannot remember individual specimens I may have sent up to the Geological Survey Museum in the more distant times, but I feel confident that were I on the spot I could point out many that would answer to my theoretical postulation absolutely.

No neolithic artifacts found in the Bijapur district remained in my collection when I sold it, but some excellent celts were seen lying upon a little tabular altar in front of a small temple on a little hill south of the Kaladghi-Belgaum road, some 20 miles south-west of Kaladghi town. All were of trappoid stone, but I could not ascertain whence they came nor how they reached their

situation on the little altar. Their occurrence recalled Dr. Arthur Evans'[1] description of a "bætylic table" in his most interesting little book, "The Mycenæan Tree and Pillar Cult and its Mediterranean Relations."

A considerable number of fine quartzite palæoliths were found by me in the shingle beds of the alluvium of the Bennihalla, three miles above its junction with the Malprabha in Dharwar district, but none remained in my collection when I parted with it. The specimens went to the Geological Survey and were transferred later on to the Indian Museum.

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[1] Now Sir A. J. Evans, *Kt.*, the very successful explorer of Knossos in Crete

CHAPTER XXII.

BELGAUM DISTRICT.

My collection contains only three specimens from this region, No. 2899, a square hammer, made of diorite, found on the road, a few hundred yards north of the Ghatprabha at Gokāk. Unfortunately the butt and one side are badly broken, otherwise it is a fine specimen and well finished to a good polish. It is figured in Plate 48 as an example of an uncommon type of implement.

No. 2900 is a very good specimen of a so-called thumbstone, a form of flaking tool not uncommon in Western Europe, but very rare in India, for I know of only one other specimen No. 3396, found close to Kanja on the south bank of the Tapti in Vyara taluq, Baroda State. The latter I have figured in Plate 19. Both are made of fine-grained trap rock and are too weathered for exact determination of the material. The Tapti valley specimen shows signs of much use at one end and is considerably larger than No. 2900 which I picked up on the bank of a nullah three or four miles south-east of Belgaum town where crossed by the road to Dharwar. It was the first thumbstone I had seen in India. The thumbholes are rather deep in this specimen, but they afford a capital hold of it when working.

The celt No. 2901 is only in the first stage of manufacture and much weathered. I found it very near to No. 2900.

In the forest-covered country forming the crest and edge of the ghâts I came across no signs of prehistorics of any age. The dense forests had probably not been penetrated by the old stone-workers. The southern part of the Kolhapur State and the northern part of the Dharwar forest region proved equally unproductive of prehistoric objects. Remains of the old people are however found in probably sub-aerial deposits near Katharigarh and Paizargarh, both naturally strong places on the eastern side of the mountainous tract. I found true quartzite palæoliths near the foot of both those hills.

CHAPTER XXIII.

BARODA STATE IN GUJARAT.

A very great geographical gap separates the geologically surveyed parts of the south of the Bombay Presidency (parts of the Dharwar, Bijapur and Belgaum districts) from the similarly surveyed parts of Gujarat which includes the Baroda State and parts of the districts of Surat, Broach, Ahmedabad and the tracts known as Mahi Kantha and Rewa Kantha. The country occupying this great gap is, as far as I know, prehistorically a terra incognita, but if closely examined by an expert there can be little doubt but that indications would be found of the occupancy of parts of this great area by some of the neolithic people. Whether the palæolithic people ever inhabited this country which is utterly devoid of the siliceous rocks of which they loved to make their arms and tools may, however, well be doubted.

In Gujarat the inhabitants were again within reach of the siliceous rock, but extremely few examples were met with of palæoliths of the types so characteristic of the Deccan and East Coast. Those met with came from the northern part of the country and had been brought down from a still more northerly region by the flood waters of the river Sabarmati at an immensely remote period and buried low down in its old alluvium. The circumstances under which these palæoliths occur will be described further on.

The first neolithic finds were made in Gujarat in the alluvial basin of the Orsang river, a tributary of the Narbada, immediately north of the town of Bahadurpur form a most interesting series of common flakes, pygmy flakes and cores of agate, chalcedony and chert and are remarkable for their intrinsic beauty of material form and colour. The flakes are numbered from 2903 to 2978, of which Nos. 2963 to 2978 are pygmy flakes and the cores number from 2979 to 3025. Among these numbers I would invite special attention to the following :— Bahadurpur pygmy flakes.

No. 2914 Flake with one serrated edge.

No. 2918 Do. chopper-shaped with one knife edge.

No. 2919 Do. with one serrated side and broad point.

No. 2936 Do. small oval with a lancet point.

No. 2939 Flake with sharp point.
No. 2947 Do. small sharp, pointed "lancet".
No. 2962 Do. wedge-shaped, short, grey.
No. 2963 Do. knife, a thin delicate little tool.
No. 2964 Do. saw, small, cutting edge serrated.
No. 2965 Do. do. do. do. do. do.
No. 2966 Do. do. do. do. do. do.
No. 2967 Do. knife.
No. 2968 Do. do.
No. 2969 Do. do.
No. 2970 Do. do.
No. 2971 Do. do.
No. 2972 Do. do.
No. 2973 Do. do.
No. 2974 Do. do. convex edge.
No. 2975 Do. do. bent blade.
No. 2976 Do. do. small, sharp, pointed.
No. 2977 Do. saw, small, pointed, sharp edge delicately serrated.

The above flakes are all of chalcedony excepting No. 2936 which is of red agate and Nos. 2975 and 2976 which are of chert.

Figures of the majority will be found in Plates 9, 10 and 11.

Of the cores several are of good shape and must have yielded flakes of very desirable quality.

I collected the flakes and other specimens under the trees at the north-west corner of the fine tamarind tope forming the camping ground north of the town. They lay partly on the surface and partly very slightly covered by sand which there forms the surface. There were no traces of a settlement and not a single pot sherd was to be seen. There was no clue to any explanation of the presence of so many cores and flakes, for no splinters and debris remained which would certainly have been the case if the place had been a factory site.

The only object of other character was a lump of softish red hæmatite or reddle ground to a spindle-shape.

Serula mace head. A find of great interest was made at the little village of Serula in Songad taluq $7\frac{3}{4}$ miles N.E. of the kasba and $1\frac{1}{2}$ miles north of the Tapti river, namely, half of a very fine mace head or ringstone of black basaltic trap (No. 3395). The surface is a little weathered but not so much as to disguise the fact that the head had been as highly finished as it was shapely. It is figured in plate 19. I picked it up on the 21st May 1892 in a scrub jungle where it had probably lain since it was broken, with no signs of any habitation site at hand or near by.

Another very interesting neolithic find was made just a year later at Kanja [1] on the south (left) bank of the Tapti 14 miles west of Serula. This was a very fine thumbstone of basaltic trap No. 3396 (figured in Plate 19). It has weathered to a grey colour and one end shows signs of its having been used for flaking. It must have been a very efficient implement as a flaker, for it fits the hand capitally and had been very carefully finished. Thumbstones are the "Tillenggerstiens" of the Swedish antiquaries.

Kanja thumbstone.

Following the numbers in the collection in their order, No. 3397 brings us to Amroli, an outlying little town in the south of the Sankheda taluq, where a small but interesting series of flakes and cores of agate and chalcedony and also a strike-a-light, No. 3397, of pale agate (which is polished by sand blast) were obtained by myself out of the alluvium, rain action having exposed them on the surface.

Amroli, Sankheda taluk.

No. 3400 is a pygmy flake of clear chalcedony with a good lancet point and is figured in Plate 10. Nos. 3406—3408 are interesting "selected stones" of richly coloured chert; and No. 3409, a polished pestle of pale pink and grey sandstone.

With the above was 3409_a a part of the side of a coarse grey earthenware vessel remarkable for having round it a fillet of impressed grains, a unique adornment, for which reason I figured it in Plate 37.

In the parts of Gujarat lying north of latitude 23° N. are many hills of "loess" or blown loam raised by the prevalent south-westerly winds and on many of these were found traces of the neolithic people who appear to have had temporary habitations upon their tops. No remains of durable buildings are to be found exposed on the present surfaces. A few such loess hills are to be found to the south of the latitude above named, but on them but few indications of human habitation were met with by me, but I cannot claim to have examined all of them exhaustively.

Sites on the Loess hills.

An interesting example of one of these temporary sites occurred on the loess hill at Kujadpura where I obtained some noteworthy specimens of pottery from the surface, most of them of grey colour. No. 3068^b is the mouth of a bottle with incised pattern, smokey grey and weathered. No. 3068_d is the side and lip of a plate of rough grey ware. No. 3068_f is the neck of a small vase with a thin upright lip and is of a fine red brown and cream colour. No. 3068^g is the side of a small painted chatty

Kujadpura hill.

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1 Kanja lies $4\frac{1}{4}$ miles east of Mandvi, a taluq town in Surat district, and $10\frac{1}{2}$ miles north by west of Vyara, the kasba of that taluq.

of smooth ware; the painted pattern is a dull purplish trellis. No. 3068_h is the foot of a small vase of earthenware, red outside and grey inside, the foot being jagged with globular steep impressions.

Jalampura Loess hill.

On Jalampura I met with parts of a human cranium imbedded in the loess in a small gully a few feet below and south of the trigonometrical cairn. I dug them out carefully with my own hands and they are all shown, as No. 3084_a, in a tray, being too comminuted to allow of building up. Besides the human bones and teeth I collected various flakes, cores and strike-a-light and some selected stones of blood-stone, agate, chert and quartz, all stones brought by human agency from long distances. Amongst them I would point out as of special interest No. 3069 a thin flake of dull green blood-stone, No. 3073 a flake of reddish blood-stone, No. 3080 a wedge shaped flake of mottled chert, No. 3082 a strike-a-light of pink red-speckled chert, No. 3083 a flake of glassy quartz and No. 3084 a small tetrahedral flake of red chert with sharp angles.

Wadeli, Sankheda taluq.

In the upper part of the alluvium of the Orsang river at Wadeli in Sankheda taluq, a few objects of interest were exposed in the left bank of the river a little distance below the village. Among these were No. 3029, a fragment of a child's bangle of bronze, one of the extremely few bronze objects I met with in all the years I have collected prehistorics. It is a plain bit of curved metal without any attempt at ornament. No. 3031_b is the foot of a small black earthenware vase. No. 3031_c is the foot of a shapely red vase; No. 3031_d of good shape also was a small black polished chatty. No. 3031_e, the figurine of a bull of red earthenware, is also noteworthy.

Sigam, Sankheda taluq.

The old site occurring at Sigam also in Sankheda taluq on the north or right bank of the Heran river yielded a much greater variety of artifacts though not actually many specimens and among them the following: No. 3034, a double-edged flake of chalcedony; No. 3035, a pygmy flake knife of chalcedony; No. 3035_a, a flake knife of agate, a very large pygmy flake figured in Plate 10; No. 3036, a curious triangular pygmy tool of grey chert with a serrated edge. No. 3041 figured in Plate 10 is a scraper-shaped worked flake of bluish chalcedony that has been used as a strike-a-light. Several objects found were made of the dense brown sandstone of Champaner age which occurs so largely in the quarries of Songir a few miles to the east. They are No. 3043, half of a Linga, and a strange object of doubtful purpose is No. 3044, carved in Songir sandstone, and in appearance not unlike the neck of a bottle or the bowl of a native

pipe, but from its association with broken antique pottery probably of greater age than the introduction of tobacco which probably was first brought by Vasco de Gama's followers in the 15th century. My friend Mr. Robert Sewell (I.C.S., retired) who is a keen antiquary, made a good suggestion, namely, that it was a pipe used for smoking ganja, a narcotic well known in the country before the introduction of tobacco. Together with the pipe was much broken antique pottery and a few other objects of interest, namely, two very large hammers or mauls of Songir sandstone, or bone crushers, Nos. 3044_a and 3044, the former square in shape, the latter round and possibly a pestle. No. 3044_a is figured in Plate 48.

Indications that the chank shell bangle industry was once followed here were afforded by five working sections of the shells being found here, but no remains of bangles were seen. They are numbered 3044_c to $_g$.

But little pottery of interest was met with at Sigām. No. 3044_h, a cylinder of dark grey earthenware, $1\frac{3}{4}''$ high with both ends truncated, probably a phallus, may be noted; also No. 3044_i, a very small disc of red smooth pottery with its edge very carefully ground, doubtless a piece to be used in some game.

Many traces of a settlement were met with at Vyara, in Waghoria taluk. A quantity of very coarse pottery lay about, also many fragments of finer quality, but unfortunately too much comminuted to be of any use. Many of the fragments of vessel-lips were very archaic in type. **Vyara.**

A curious little carved piece of hard green chlorite schist, No. 3049, found by my daughter Miss V. A. Foote, bears a certain resemblance to the head of a hornless bullock. I have figured it in Plate 16.

No. 3050, a round-faced round hammer of sandstone, is noteworthy and so also No. 3055_a, a lid or stopper of earthenware with a cushion-shaped base. No. 3055^b is part of the wide flattish lip of a vessel of bright red earthenware. No. 3055_c, is a small cone, a phallus? with both ends truncated.

A site, interesting from its being on a small islet in the bed of the Tapti at Kamrej with very steep almost inaccessible sides and very defensible, yielded several objects of interest, *e.g.*, No. 3066, a hammer face of gabbro and No. 3066^a a round hammer of sandstone. **Kamrej islet. Nausari prant.**

No. 3066_b is part of a bangle made of chank shell carved into an elegant tall zigzag pattern that I never met with in any other of the many localities where I found bangles made of this material. It is figured in Plate 42.,

No. 3066_c is the shell of a species of Purpura which has lost its colour from age and weathering. Whether the neolithic or early iron age people had any acquaintance with the art of dyeing yarn or woven material with murex purple is a point deserving of enquiry.

No. 3066_g is a disc of bright light red earthenware (brown inside) with an hour-glass shaped drill hole through the centre.

Galha.

No. 3067, a round hammer, the body a flattened cylinder, made of a puddingstone of small trap pebbles strongly cemented with a whitish calcareous cement; one end wanting; figured in Plate 48. The hammer had been ploughed up out of the fields west of Galha on the right bank of the Tapti 4 miles N.E. by E. of Kamrej.

S. of Barria.

Of very considerable interest are the objects I collected at an old site on the top of the cliff forming the right bank of the Watrak. Of these I would draw attention specially to a fragment of pottery of the Mysore type No. 3165_a, the lip and neck of a rough red earthenware chatty showing a fillet of vertically arranged pitlets. This has been figured in Plate 32.

The other objects are flakes and scrapers, altogether 35 in number, of which 15 are of chert, 16 of agate, 3 of chalcedony, and 1 of glassy quartz; besides these are 24 cores of chert and 12 selected stones, of which 2 are of bloodstone, 9 of chert and 1 of jasper. Worthy of special notice are the following specimens: No. 3101, a chert flake with one end trimmed into a scraper; No. 3117 has both ends pointed; No. 3122 is a chert flake with sharp edges, while No. 3123 is a chert flake with chipped edges; Nos. 3124, 3125, 3126 are flakes having each one sharp edge; No. 3127 is a chert wedge; Nos. 3128 and 3132 of chert may have possibly served as arrow points; No. 3133 is a chert scraper; Nos. 3135 and 3136 are pygmy flakes of chert and No. 3131, a pygmy flake of agate. The agate flakes Nos. 3106 to 3115 and 3118 and 3120 have all got sharp edges; No. 3121 has both edges serrated and No. 3130 has "file-like" edges.

Flake No. 3129 is made of glassy quartz, a material the old people rarely made use of as it lent itself very badly to chipping. The cores are mostly of the flattish kind and short. No. 3137 is very shapely and shows that twelve flakes were struck off it and No. 3150 is curved and claw-shaped. The series is one of considerable interest.

Bardoli hill. Glassy quartz flakes.

From the top of the 300 Loess hill Trigonometrical station, west of Bardoli in the Dehegam taluq, I collected 19 flakes, large and small, of which no less than 10 were of glassy quartz, four of

chert, 3 of quartzite and 2 of agate, beside some selected stones (a small chalcedony geode and 1 fragment each of jaspery chert, agate and laterite).

From the top of the Loess hill, south of Dungarva I procured 6 chert flakes Nos. 3194—3199, of which 4 are scraper-shaped and one has a cutting edge; a core of glassy white quartz was also found and a piece of granular quartz. Besides these I found four interesting fragments of pottery, of which No. 3201_a is the side of a vessel of dark red coarse material showing a fillet of impressed vandykes. No. 3201_b is part of the side of a vessel of brown polished ware. No. 3201_c is a lid handle of red rough ware of flattened mastoid shape. No. 3201_d is part of the lip of large bowl of red rough earthenware showing gashes across the grooved "T"-shaped lip, a very uncommon form of decoration. Dungarva hill.

The top of the Mulsan Loess hill yielded me 31 specimens, several of which deserve special notice, *e.g.*, No. 3204 a pygmy implement, with file edges very delicately worked, of light red somewhat coarse chert. No. 3211 is a pink mottled flake with a chisel point. Nos. 3224 and 3225 are incurved scrapers of chert, the former of reddish brown and white mottled colour, the latter small and thick and of raw sienna colour. No. 3206 is a chert core, light red in colour, with a wedge-shaped end. Four short flakes had been struck off. No. 3207 is a circular scraper of dark red and cream chert which appears to have been touched by fire. No. 3208 is a chert scraper mottled pink in colour which shows a sharp-bevelled edge. Nos. 3212 and 3213 are rare objects, namely, strike-a-lights, made of glassy white quartz. Mulsan hill.

From an old site at the head of the gully system which cuts deeply into the alluvium of the Sabermati at Mahuri in Vijapur taluq, I secured a small number of neolithic objects, amongst which were several of sufficient interest to deserve special notice. No. 3237 is a small thick disc of pale drab quartzite which is figured in Plate 15. It was ground smooth and may have been polished originally. No. 3238, a mealing stone with one used and one neglected side, is also made of pale quartzite. Nos. 3239 3240 and 3242 are nice scraper flakes of coloured chert, and No. 3241 is a nearly circular scraper of light-red and dark-red agate with a crackled surface. From near this site came several noticeable pieces of pottery of which No. 3246–1 is the most interesting as it represents a sacred bull with a garland round his hump indicated by square pitlets in the red polished mass. The figurine, which is rather shapely, has lost its head. It is figured in Plate 38. No. 3246–2, the shoulder of a chatty of fine light Mahuri.

grey ware, is also deserving of attention on account of its decoration which consists of a raised rounded fillet below two fillets of vertical impressed barlets. No. 3246-5 is a fragment of the shoulder of a chatty scarlet lake in colour which is of very rare occurrence.

Palæoliths in Sadolia section.

The next objects to engage attention are of great interest and importance in proving the former habitation of palæolithic man in this part of the country or rather of a tract lying rather further northward around the headwaters of the present river. The artifacts under consideration are Nos. 3247 and 3248, the former a worked flake, the latter a fine axe of the Madras type.[1] These had been washed out of a shingle bed very low down in the alluvium of Sabarmati on the right bank of the river opposite to a village of the name of Sadolia on the left bank (in the Parantij taluq). Three other palæoliths of fair quality were found by myself at this place and were placed in the Baroda Museum.

The two palæoliths now in question are made of coarse, very gritty quartzite and are both rather water-worn. The flake (No. 3247) is chocolate-coloured and the axe which is a remarkably fine implement is of pinkish white and figured in Plate 1.

Pedhamli shingle bed.

Another noteworthy palæolith of very coarse quartzite grit, the coarsest I have seen worked into an implement, was picked up by me on the surface of the shingle bed it had been washed out of, a few yards south of the village of Pedhamli in the Vijapur taluq on the right bank of the Sabarmati and 15½ miles higher up the river than Sadolia. This implement, which is very shapely despite the ultra coarse material it is made of, is a rather narrow pointed oval in shape and mottled brown and bluey in colour. This specimen, No. 3309, will be found figured in Plate 2.

Site on the Hirpura plateau.

A very interesting site geologically and neolithically, if such a word is allowable, is the Loess plateau on the right bank of the Sabarmati north of the large village of Derol, for near the centre I met with a most interesting series of selected stones as well as a smaller number of flakes and scrapers of chert.

The selected stones that chiefly attracted my attention, because they had been so manifestly brought there by human agency, were pebbles and fragments of a lovely pale green Amazon stone (a felspar), of which I had noticed many crystals in granite

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[1] I exhibited it to the Geological section of the British Association at Oxford where it was greatly admired by Sir John Evans and the other prehistoric leaders, while a short paper I read on the bearings of this find on the "Hiatus" theory was well approved of (see p. 14).

veins in the bed of the river some distance further up. The specimens of Amazon stone are eight in number, Nos. 3262 to 3269. Other selected stones are Nos. 3282 to 3299 of pinkish and reddish or bluish white chert and Nos. 3300 to 3303 of dark grey and white mossy chert. Nos. 3304 and 3305 are specimens of glassy quartz. Specimens on the loess plateau must have been carried up by some man from the bed of the river where alone any stones are visible in this neighbourhood.

Patan, old and modern

The modern city of Patan is built on the ruins of an ancient city[1]; and among these old ruins I found a few objects of decided archaic appearance and deserving of passing notice. No. 3311_c is a small jar or crucible of pale red earthenware. Excepting for a trifling chipping of the lip, it is entire and had not been subjected to the destructive heat of a furnace. No. 3311_d is a cone of rough pale red earthenware. The top is truncated and the ground base is very slightly broken. No. 3311_e is a lid or stopper of pale red earthenware; the hollow flat base has a bevelled edge and the top is broken. No. 3311_f is a small disc of pottery, one side of which is covered with blue enamel and the other shows light red earthenware. The edges of the disc which is thick for its size have been well ground. There can be little doubt that this and other discs were used as pieces in some game like shovel board.

Vasravi iron slag mounds.

An iron age site of great interest occurs at Vasravi in Velachha taluq, where the existence of an important iron smelting industry is shown by the great size of the mounds of iron slag there remaining. On the top of the great mounds, which I went over three times, several interesting objects rewarded my visit. No. 3314 is part of a plaque with one foot preserved made of red brown nummulitic limestone. No. 3315 is a truncated cone also of red brown nummulitic limestone, a rock which occurs largely in the neighbourhood. The specimen is considerably broken and like the foregoing one much weathered. No. 3315_b is part of a lid of some small vessel made of rough red earthenware. The lid is remarkable for the large round knob which crowns it. No. 3315_e is a disc of blue and white enamelled fayence. The edges of the disc have been coarsely ground. No. 3315_d, a corn-crusher of dark amygdaloid trap round in shape, so well rounded indeed as to suggest that it may have been used as a ball in some game played on the ground. At some little distance westward from the great mounds in the bed

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[1] The capital of the last Hindu dynasty of Gujarat, destroyed by the Muhammadans in 1298.

of a small but intensely saline stream I found imbedded below the surface of the water a large bowl of which No. 3315_a is the remnant, the rest of the vessel having been so absolutely rotted by the action of the saline water that it crushed up into a squashy pulp in my hands as I tried to raise it. The bowl which was made of polished blackware was a fine looking object as I first saw it under the water and I was much concerned at its destruction. This was my first experience of the destructive action on pottery of saline water, but even had I taken special precautions to try and raise the bowl entire—I don't think it would have been possible to have saved any more of it—it was far too much decayed already. I have figured the remaining fragment in Plate 39. The Vasravi people could give me no information as to the history of the iron industry which had caused the formation of the great slag mounds, and the same was the case with regard to the equally important iron industry at the great slag mounds at Samdhi in the Sankheda taluq north of the Orsang river.

Effect of strong brine on black pottery.

Naroli Nahani.

At a place called Naroli Nahani some miles south-westward of the Great Vasravi slag mounds, I obtained an excellent series of cores, flakes and strike-a-lights which were met with on the top of the laterite plateau, south of the village.

The site was apparently a factory for small flakes, the cores remaining, 44 in number, being small in size. Strike-a-lights were evidently a speciality, 18 of them having been found, a larger number than met with in any other locality. Two of these are made of chert, the remaining 16 of agate or chalcedony; of the cores 21 are of agate or chalcedony, 1 of jasper and 22 of chert. Of the 9 large flakes enumerated 5 are of agate, 2 of bloodstone, 1 of jasper and 1 of chert. Besides the above were a slingstone of dark grey bloodstone and four selected stones of chert, bloodstone, agate and jasper respectively.

Bodeli.

A small number of good agate cores was found scattered about the surface north of the railway terminus at Bodeli in the Orsang valley. One, No. 3045 of glassy white quartz is in the collection.

Samdhi.

On the surface around the great iron slag mounds at Samdhi above referred to, I found various agate and chert cores and a few flakes and strike-a-lights. No. 3046, a chalcedony flake, No. 3047, an agate core and No. 3048, a dark brown chert double core, are shown.

On the bank of the Mohar river opposite Kappadwanj a good triple core, medium size, of red and white mottled chert, was found by me, which showed distinct sand blast polish.

The highest sand-blast polish I have ever come across I noted on a double core of orange agate I found on the low loess hill north of Wasai in Vijapur taluq. This core No. 3236_a is figured in Plate 12.

In front of a tiny shrine in a deep gully at Banpura I found a number of animal figurines one of which No. 3261_a is in the collection. It is quite small in size. On the left or south bank of the Gooma river in Sauli taluk Miss V. A. Foote found a very choice little chalcedony core, milky with glassy lustre. It bears the number 3058.

CHAPTER XXIV.

NOTES ON FINDS MADE IN KATHIAWAR.

The end of 1893 and the first half of 1894 were spent by me in making a geological survey of the Gaekwar's provinces in Kathiawar and they proved rich in prehistoric remains mostly of somewhat later age than those met with in the Gujarat provinces.

Amreli prant and town.

I commenced the survey at Amreli, the principal town in the prant or province of that name. My work in Kathiawar was very materially lightened by the great courtesy and kindness of Major Ferris,[1] the Assistant Political Agent, who also showed great hospitality to my wife and self. He took much interest in my prehistoric researches and very generously presented me with a choice little collection which he had made on the old site at Ambavalli. I shall have to refer to his specimens further on.

Machiala Nana.

Among the more noteworthy of my finds, I would mention the following: No. 3410β, part of a shallow plate with wide rim, light red in colour and polished, quite unlike any of the southern pottery. It stands on a very low foot. It was found near the village on the right bank of the Tepi river several miles north of Amreli.

Versara.

No. 3410-1 is an interesting and well-made pygmy flake of crimson jaspery chert found at Versara, 7½ miles north-east by east of Amreli. It is a very pretty object.

Damnagar.

Further east still at the town of Damnagar in the fields north of the camping tope, a great number of chank shell bangles were found—Nos. 3410*c* and 3410-4 to 3410-44, and as usual all had been broken. They showed many patterns. With them I found a remarkable bead made of a Trochus shell, the sides of which had been perforated in three places by grinding. A figure of it will be found in Plate 41. Beside these, I obtained from the same spot No. 3412, a small hammer of pale green and purplish bloodstone; and a slingstone of white chert in a brown base, the number of which is 3413.

Rupavati.

Interesting remains of a small copper smelting industry were met with a little to the west of Rupavati, a village 15 miles

[1] Colonel Ferris has lately retired from the Political Agency at Kolhapur where he had won the esteem and affection of all he came in contact with (November 1908).

south-east by south of Damnagar; they were small heaps of copper slag and many small pieces of malachite (carbonate of copper) lying about on the surface. The villagers could give no information about the industry or the provenance of the ore close to the slag heaps. On one heap I found a very interesting belted hammer of grey gabbro which had been very badly used and was much broken; the face and belt or groove for the handle are however fairly preserved, and the latter shows that a high polish had been given to the implement in completing it. It is figured in Plate 37 and bears the number 3428. While striking my camp at Rupavati, an old shepherd passed close to me spinning with a distaff. The rays of the rising sun glinted on the spindle whorl as he moved along and I got him to show it to me. It was evidently prehistoric in age and had been found in the ruins of an ancient village some miles to the south and outside the Baroda territory, and to my great regret I was unable to visit the old site. The old man was quite willing to part with his spindle whorl and sold it to me and went off quite pleased with himself. The spindle whorl is made of pale brown polished earthenware and is numbered 3423*f*. In shape it is very like number 2605*s*, a spindle whorl I found at Patpad in Kurnool district. On my return march to Damnagar, I found an interesting series of cores and some good selected stones (agate, chert and jasper) as also some small flakes near to the mosque south of the town. These are numbered from 3429 to 3445.

Ambaldi hill.

Some 8 miles to the north-east of Damnagar on the top of Ambaldi hill I found a small number of scrapers, cores and selected stones, of which No. 3446, a small and broad scraper of red chert, has been figured in Plate 13, because shapely and well made. It is difficult to divine for what purpose these very small tools were made. All the scrapers, cores and the selected stones with one exception are of chert. The exception, No. 3454, is a green moss agate. The only object not of stone here found was the spout of a vessel of brown earthenware of no special interest.

Khijria Tappa. Pottery of Greek facies.

After leaving Ambaldi I visited Vala State, where Vala town is a place of some interest to be described further on.[1] On my return thence to Amreli I travelled along the railway, rather north of the Damnagar taluq, and in so doing crossed the little outlying Tappa of Khijria, and to the west by south of Khijria village hit upon a small but very interesting pottery site. The specimens found were unfortunately mere fragments but deserving of much notice, because of the very high class quality of

[1] See page 154.

many of them which present a distinctly classical Greek facies and are utterly unlike the pottery finds made elsewhere with two exceptions. The ware is red or pale red in colour and very hard in texture, having been well fired. Various pieces show very high polish. Several pieces are deserving of special notice, for example, No. 3493-77, figured in Plate 18, the low conical lid of a vessel strangely small to be furnished with a steam hole. It is of red ware unpolished but shapely, and unluckily its edge is much broken. No. 3493-81 is part of the side of a vase of very fine quality, light red in colour and half polished. The middle of the fragment shows a thick rounded fillet below four flutings. Below the fillet is a plain band. In the figure the flutings are represented as occurring above the fillets, but I am doubtful if the fragment should not have been turned the other way. The curve of the fragment is but very slight, so the perfect vase must have been of good size and doubtless a very good-looking specimen of the fictile art, though unfortunately too little remains to allow of attempting a pictorial restoration. No. 3493-87, also figured in Plate 18, though but a small sherd, is a remarkable one, because so absolutely unlike any other of my other finds elsewhere. It is of hard isabel coloured terra cotta and shows a band or part of a band of strong reedings which probably occupied the bulge of the vessel, which as shown by the slight curvature of the sherd, must have been one of very fair size. No. 3493-98 is the base of a vase or bowl of light red polished terra cotta, buffy in colour underneath, and the entire vessel must have been a very ornamental one. It is figured in Plate 31. Of the unfigured specimens, Nos. 3493-82-83 and 84 are deserving of special notice on account of the beauty of their material and colour. The ware is very dense and hard in texture and beautifully polished, and I have nowhere else seen anything so truly high class. From the perfect polish retained by these sherds it is clear that they can only have been exposed for a very short time. The site, which I left with great regret at being unable to revisit it and make excavations, lies about half a mile south of the railway bridge over the Tepi river, which runs south past Amreli into the Shetranji river.

Akkadia Mota. Lying some 8 miles west of Amreli is the village of Akkadia Mota, around which I collected a very good series of strike-a-lights, scrapers, cores and flakes of chert, agate, chalcedony and bloodstone of considerable beauty. With them were some 9 or 10 selected stones of chert of gay and striking colours. The numbers run from 3494 to 3531. Of these special attention is due to No. 3498*a*, a scraper of purple and pink chert furnished

with nicks to help attaching it to some kind of handle. They are placed one on each side at one end.

Babapur.

Thirteen miles to S. by W. of Amreli at Babapur the alluvium in the left bank of the Shetranji river above the village yielded a large and important series of flakes, scrapers, strike-a-lights, sling stones and cores and a few selected stones, numbered from 3533 to 3615. The most noteworthy of this series is No. 3568, a thin, leaf-shaped flake of wine-red chert, very delicately biserrated. The bulb end is wanting. Of much interest also is No. 3570, a triangular piercer of brown red chert, which would have been very efficient in making holes in leather or wood. The three strike-a-lights, Nos. 3543, 3544 and 3545, of rich coloured chert, would from their good shapes have proved very useful had they ever been brought into use.

The Babapur site yielded some 13 broken shell bangles, one of which, No. 3615–1, shows a raised fillet of right sloping barlets lying between two grooves. It had been rolled but not enough to mar the uncommon pattern materially, so I figured it in Plate 42. Of pottery I obtained only ore sherd, the foot of a small vase of red polished pottery. It bears the number 3615-*a*.

Site south of Babapur.

From a small site two miles above Babapur on the left bank of the river, I got 7 sherds of earthenware of good quality. These are Nos. 3621-*b* to *g*, and No. 3622-*b*. All are noteworthy, but the best which is quite unique in its colouring is No. 3621-*e*, the shoulder of a much painted pot polished outside but rough inside. The colour is applied in bands seven in number, of which one broad and two narrow bands are red, three bands are purple and one is pink. A well-shaped oval trimmed flake of white agate which came from this site will be found figured in Plate 10, No. 3622. Very many of the flakes and other artifacts procured at and to the south of Babapur are made of variolitic chert, a stone forming several veins in the western part of the Dhari taluq. Shades of yellow or yellow brown are the most characteristic colours of these artifacts.

Ambavalli.

Beside the large series of shell bangles, Ambavalli site did not give much of great interest, as very little good pottery was met with and no specimens of neolithic stone work. No. 3622–71 is the mouth of a small water bottle of light red earthenware painted red. No. 3622-72 is the lip of a goblet, thin and upright, of red polished ware. No. 3622-79 is a spindle whorl of pale reddish rough earthenware. No. 3622-80*a* is a small crateriform bowl, nearly entire, of pale reddish ware.

The old site at Ambavalli from which Major (now Colonel) Ferris gave me so many interesting specimens, yielded a capital

series of chank shell bangles, many of which show remarkable patterns about which much might be said if space allowed; but the 17 specimens I have figured in Plate 43 will speak better than verbal descriptions.

Samadhiala.

The environs of Samadhiala (22½ miles south of Amreli) to the north and north-east of the village, yielded some good specimens of flakes, scrapers, cores, strike-a-lights and selected stones. The flakes, scrapers and cores are of various, mostly bright coloured, stones as chert, bloodstone and chalcedony, the most noteworthy specimen being No. 3624*b*, a triple core of rich blue green bloodstone. Another triple core, No. 3626, of interest is made of bluish chalcedony. No. 3629 is a strike-a-light of dull brownish red chert, square in plan, with three bevelled sides.

Umria.

The environs of Umria, a village 31 miles south of Amreli, proved very rich in small chipped neolithic artifacts made of chert, bloodstone, chalcedony, agate and quartz and shaped into flakes, scrapers, incurved scrapers, flake knives, strike-a-lights and many cores. In company with these artifacts were many selected stones of much beauty of colour. The best finds were made on the maidan south of the village and on the open plain (also a true maidan) lying to the north-east of the village and stretching away to the foot of the great Lapala hill.

The specimens found south of Umria are numbered from 3632 to 3718. Those found to the north-east are numbered from 3719 to 3846. Of the former series I would call attention to Nos. 3635 to 3637*b*, and of these to No. 3636 which is a scraper incurved at both ends and figured in Plate 13. It is a very shapely little tool which would have served well for scraping thin wands for arrow shafts. All of these incurved scrapers are entire. Many of the chert and agate cores are such pretty objects and bright coloured, that one wonders they were not drilled and converted into beads, but their beauty for that purpose does not seem to have struck the neolithic people.

Beauty of the chert and agate cores.

Of the finds made to the north-east of Umria village by far the greater number are cores made of chert, bright coloured in many cases. Flakes, scrapers and strike-a-lights were of rare occurrence; of the flakes Nos. 3762 to 3766 might, from their shape, have served as arrow points, but they were not specially worked for that purpose and show neither barbs nor tangs like the typical arrow-heads of other countries. Nos. 3754 and 3755 are good chert strike-a-lights, the first oval and the second circular in shape. No. 3761 is a graving tool or "burin" of deep red chert. The selected stones Nos. 3839 to 3846 are all specimens of chert of very varied and mostly gay colours.

From the left bank of the Chakrora nullah, a few miles south of Umria I obtained several good cores of chert, one of which No. 3849 may have been intended for a strike-a-light. It shows 10 radiating flakes and is of pink colour. No. 3854 is a triple core of chalcedony from which 4, 9 and 4 flakes had been struck in three several directions. Chakrora nullah.

The Nigala Tappa, a small but interesting outlying patch of the Baroda territory, 42 miles south of Amreli, gave me a couple of good chert scrapers, No. 3855, deep crimson and purplish in colour, and No. 3856, crimson, orange and blue in colour and showing a large bulb of percussion. No. 3857 is a flake knife of chert, dull crimson in colour and quadrangular in section with one cutting edge. Nigala Tappa.

Of the 11 cores here collected, Nos. 3859 and 3860 are of chalcedony, and the remaining 9 of richly coloured chert, probably taken from the once important but nearly worked out small vein of that rock which occurs to the southward of the village of Nigala 42 miles south of Amreli. This vein yielded 22 of the selected stones (Nos. 3869 to 3890), only one, No. 3891, being of white agate. The vivid colouring of the selected stones is very remarkable.

Another source of the richly coloured cherts so largely utilized by the neolithic people was a vein occurring at Khamba a Gaekwari village on the Dhantravari river, 10 miles north of Nigala. Khamba.

In the flat tract between Umria and Bhard in the centre of the Dhari mahal, or taluq, I collected, beside a series of 13 capital brightly coloured chert cores, a fragment of what I regard as a possibly true worked arrow-head of brown grey chert. This bears number 3892 and is figured in Plate 14. It is distinctly worked and appears to be the tang of a true arrow-head, but the only one I really accept as such, with confidence. A true arrow-head.

Of the localities yielding prehistorics that I happed upon in the south-western part of the Dhari taluq in February and March several were rich in cores, small scrapers and worked flakes of chert; of many and often rich colours, as well as some of agate and bloodstone. A number of selected stones of the same materials accompanied the above.

Two of the localities rich in these pretty stones occurred at Chachai, 13 miles from Dhari, the one at the foot of the big conical hill north-east of the village, the other at foot of the hills across the valley south of the village a couple of miles to the southward. The number of small flakes corresponding in size to Chachai.

the cores which were found with them was very small: they had doubtless been carried away to be used elsewhere. The uses these small flakes were put to are not very obvious and the question is one affording grounds for speculation; they may have as already hinted at page 22 served for heads to small drills, as points for tiny arrows and as points for tatooing instruments. The chert came from small veins which are met with here and there in the trap rocks. Different fragments of the stones chipped evidently varied in their readiness to chip nicely and where they flaked kindly the makers went in occasionally for making secondary and more rarely for making tertiary sets of flakes off the same selected stone. These secondary and tertiary sets of flakes always lie in a direction different from the primary set which was almost invariably the principal set in importance.

Of especial interest among the specimens found at the two Chachai sites are the following:—

From the square foot of Chachai Hill North—

No. 3922—Flake of white agate, three sides trimmed.
No. 3921—Arrow points ?? of spherulitic chert.
No. 3925—Double core, chert, deep dull crimson.
No. 3926—Double core, chert, deep red brown.
No. 3929—Double core, chert, deep dull crimson.

From the north foot of the hills, south of Chachai village—

No. 3972—Flake scraper of yellow ochre chert.
No. 3975—Flake, triangular pinky chert.
No. 3977—Scraper of white agate.
No. 3979—Strike-a-light of red chert.

The Gir.

From my camp at Chachai I completed the examination of the plexus of high hills around the Sar Kala peak (2128′), the highest point in the "Gir", the large forest tract in which alone lions remain in India and though I wandered far and wide in the forest, I came upon no traces of them. From Chachai I could not march down direct to Kodinar, a small port on the coast, but had to return north-eastward to get on to the highroad leading from Dhari to the sea and in so doing I had to camp at a place called Dhalkania, and there came on an old pottery site about half a mile south-west of the village lying on the west side of a rather deep gully. On the surface of the fields there, I collected a rather interesting series of pottery fragments of a kind quite unlike the recent local ware and of very superior quality. The majority of the sherds are of pale or light red colour and unpolished, but No. 4041-17, the foot of a vase of fine quality, is of bright red colour varnished; so also is

Dhalkania pottery site.

No. 4041-21, the side of a medium sized chatty, bright red in colour and polished, with a plain fillet above a groove on the shoulder of the vessel. No. 4041-24 is the side of a medium-sized dish, or saucer, with a wavy inside surface; the vessel is of light red ware polished externally. Nos. 4041-30 and 4041-31 are sides of vessels of light red terra cotta. No. 4041-1 is the lip of a vase of pale red terra cotta with a left barred fillet. No. 4041-3 is the lip of a flattish dish-like vessel of red polished ware with a very widely expanded slightly curved lip.

Note.—In Addendum No. XX will be found notes on the coasts of Okhamandal.

CHAPTER XXV.

FINDS MADE IN VALA STATE.

The objects I came across in this small State should, I think, be classed as protohistoric rather than prehistoric, a decision in which I was confirmed by studying the contents of the small museum the Thakoor of the State had established for the preservation of the larger antiquities which are found from time to time, when the ruins of the old city of Vallabipur are exposed by digging foundations for new houses, the modern town standing on the ruins of the ancient one which was reputed to be one of the most ancient of Hindu settlements. The Thakoor showed me his little museum with just pride and presented me with No. 3457, a fine specimen of a double club-ended pestle made of mica trap of very fair finish and drab in colour. The general shape may be described as a compressed cylinder and the whole was well polished originally.

An old villager who had seen me hunting about for beads brought his collection, made before my arrival, and I looked through it carefully and found that it consisted mainly of the contents of a lapidary's shop which were so interesting that I bought them of him. It is included in the Nos. 3460 to 3480, the most interesting object being No. 3460, a plano-convex lens of limpid rock crystal about an inch in diameter. This was doubtless meant to be used as an eye for an idol. Similar eyes are to be seen let into figures of Kali with a deep red piece of tinsel underneath to give the face the wicked bloodthirsty expression so much admired by her votaries. No. 3464 is a small piece of brown and white onyx cut table shape, but left unpolished. No. 3479 is the head of a small seal of sardonyx well cut but without any device on it. Nos. 3465 to 3478 and 3480 are beads, 4 of crystal, 5 of sardonyx, 3 of onyx, 1 of agate, 1 of amethyst and 1 of lapis lazuli; several are rough and imperforate.

With the above are two lots of chips, the one, No. 3484, of chalcedony of dark and light green, lovely tints apparently produced by copper staining; the other lot, No. 3485 of red sardonyx. No. 3459 is a small thin disc of brown trap, some piece in a game in all probability.

The ruins of old Vallabipur proved to be rich in chank shell bangles with which I collected a few marine shells of interest:

No. 3493-2, a Nerita shell perforated and made into a bead; No. 3493-3, a perfect Nassa shell and 3493-5, a small conus also perfect; No. 3493-6 (figured in Plate 41) a very small thick cushion-like discovery carefully finished but not polished: it may very probably have been intended for a bead, but have remained imperforate. Of the bangles many show very considerable ornamentation and ten of them were accordingly figured in Plate 42, but many of the unfigured ones are also worthy of examination.

An object of no little interest is No. 3493-76, an archaic Hindu figure of a lion made of miliolite limestone, now much weathered and dirty pinky grey in colour.

CHAPTER XXVI.

JETPUR STATE, KATHIAWAR.

On the 18th February 1894, I worked to the eastward of my camp which I had occasion to pitch near the Kankawao station on the railway, 16 miles west by north of Amreli, and on a low rising ground came across a site, east of the old ginning mill on which there was scattered about a great deal of broken pottery of a type I was then unacquainted with. A great search for fragments of vessels of recognizable shape resulted in my collecting the following series in which are several of decided interest.

The specimens No. 3911-3-4-5 and 6 are lotahs of rough ware pale red in colour. No. 3911-8 is a red chatty bowl with the side sharply turned down and out. No. 3911-10 is the lip of a very flat dish of fine grained but unpolished ware. Nos. 3911-11 to 17 are bowls with upright sides and sharp edged lips of light red ware. Nos. 3911-13 to 17 are painted deep and bright red; 3911-14 shows deep red on top of the lip; 3911-15 shows four lines of dark red brown. No. 3911-18 is the large and thick lip of a very shallow platter; it is painted with brown bands on bright red. No. 3911-20 is the upright lip of a large vessel of very pale red ware painted a deep red. No. 3911-21 is the upright thick lip square topped of a large vessel of very pale bath-brick ware painted red brown and is figured in Plate 33. No. 3911-23 is the lip and neck of a medium-sized chatty of greenish grey colour. No. 3911-25 is part of a small upright vessel of bath-brick ware with a fillet round the middle of it. No. 3911-30 is the conical lid of a small vessel which was not found. The lid which is black is greatly corroded by the action of the brackish water I found it in, for I picked it out of a small but very saline stream. In shape this lid corresponds closely to a lid No. 1516*a* which I found at Sindavallum in Bellary district, and figured in Plate 38. No. 3911-13 is a disc of rough brown ware perforated by a well-drilled hole which is not centrical however; No. 3911-52 is a remarkable disc of light brown ware, slightly biconcave and with the edges ground round; the biconcavity of the disc must have been due to its being intentionally made of that shape; it is evidently not a mere converted sherd as are the great majority of other pottery discs. It is figured in Plate 31.

The whole of this series is *sui generis* and the site deserving of much closer search. My geological work in the Amreli prant of Baroda lay many miles to the southwards and I never had another opportunity of visiting the Kankawao site much to my regret.

CHAPTER XXVII.

KALAT STATE, BALUCHISTAN.

Four specimens, fragments of three funereal urns and one bowl, were presented to me by Mr. Hughes Buller, I.C.S., who procured them at Sompur Doab. The urns are remarkably unlike any type of pottery met with in the south of the peninsula, in the Deccan, in Gujarat or Kathiawar, and are of extraordinary coarseness and of very pale colour. The bowl is creamy pink in colour and the fracture pale red with a sandstone texture.

They bear the numbers 4132 to 4135. The fragments are of insufficient size to give much idea of the size or shape of the vessels.

CHAPTER XXVIII.

SIND.

The prehistoric objects obtained from this province are flakes and cores of flint from Rohri on the left bank of the Indus, some of which were given to me by my old friend and colleague, the late Dr. W. T. Blanford, F.R.S.; these were Nos. 4044 to 4050. The other specimens Nos. 4051–4053 I procured from the Indian Museum in exchange for South Indian palæoliths.

No. 4054, the largest of the cores and a remarkably fine specimen, made of grey mottled flint, probably came from Rohri also. It was given to me by the late Mr. George Lavelle (of the Mysore Geological Department) who found it, as a paper weight, on his father's table after the latter's death[1] and believed it to be of Indian provenance—an idea which the nature and workmanship of the core strongly favours. The size of the flakes struck from this core would have fitted them well to be used as razors or knives. It is figured in Plate 52 and the saw-flake No. 4047 is figured in Plate 9. The flakes obtained at Rohri are of poor quality as compared with the cores that might be expected.

[1] Michael Lavelle, the rediscoverer of the Kolar Gold Mines in Mysore, a man much respected by all who really knew him.

CHAPTER XXIX.

NOTES ON SPECIMENS FROM THE JABALPUR DISTRICT.

The small series of neolithic remains from Jabalpur included in my collection was obtained from the Indian Museum by exchange for the purpose of comparison with the cores and flakes which I had found in some quantity in the Ceded Districts, Gujarat and Kathiawar. In the only visit I paid to Jabalpur my attention was devoted to geological features and I came across no prehistoric remains of any kind; moreover I had only a couple of days at my disposal and was not on the lookout for such things.

The specimens that I obtained, Nos. 4055 to 4073, consist of a burin, 2 flakes, a scraper, and 15 capital and very typical cores of chert and jasper.

The most interesting specimen in the series is No. 4055, a burin of chert of the identical shape of the flint burins used by the old palæolithic artists of the French bone caves to engrave upon bone and ivory their wonderfully spirited sketches of their animal contemporaries. It differs in size only from a specimen from the well-known caves of Les Eyzies in Dordogne (France) now in my private collection. The Jabalpur specimen measures $2\frac{7}{16}''$ in length against the $3\frac{9}{16}''$ of the French specimen, and is made of pale greenish yellow and white chert with a pink tip, while the latter is made of flint.[1]

The two flakes Nos. 4056 and 4057, the former of chalcedony and the latter of chert, have both of them well marked bulbs of percussion. Of the cores special attention should be given to No. 4061 (a double core of red banded jasper) and Nos. 4072 and 4073 (both made of agate) on account of their good shape and workmanship.

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[1] In Plate 12 the burin is represented as showing a projecting lump on its right side, this was owing to the accidental slipping of the piece of wax which fastened it to the upright frame in front of the camera.

CHAPTER XXX.

BANDA STATE.

The three neolithic objects obtained from this part of Central India were procured by me from the Indian Museum by exchange effected in 1887 with my friend, the late Mr. Wood Mason, the then Superintendent of that institution. Two of these artifacts, Nos. 4074 and 4075, are celts of the ordinary axe type made of basic trap rock, the third No. 4076 is a hammer axe of similar material. They offer no specially noteworthy features of shape or otherwise, but are distinctly of interest as showing great resemblance to weapons of the same type from Southern India which are in the collection, from which it is a legitimate inference that their makers must have had the same ideas as to shape and the process of manufacture, and were in fact on the same plane of civilization and very probably contemporaries.

CHAPTER XXXI.

REWAH STATE.

With only one exception the specimens in this interesting series were given to me in 1898 by my friend and colleague Mr. Richard Dixon Oldham, late of the Geological Survey of India, who was, as far as I know, the first person to discover palæoliths in this part of India.

The palæoliths are of especial interest as they are made of porcellanite, a kind of hornstone or baked shale which occurs in the lower Vindhyan rocks of this region. Palæoliths of porcellanite.

The very great amount of weathering the implements have suffered is a strong proof of their great antiquity, and the great change the stone has undergone is clearly shown in some of the accidental chips that have been befallen them, the unaltered stone being quite dark, almost black in colour, while the weathering of older breakage shows in shades of grey of greater paleness according to their age. This is specially noticeable in No. 4079, the outer surface of which is quite drab in colour. No. 4081 is a very rude scraper of light brown drab weathering yellowish and No. 4082 is a chopper of similar colour. A specimen of great interest from the Rewah country which I obtained by exchange from the Indian Museum is No. 4104, a very shapely little pointed-oval palæolith of creamy quartzite very similar in quality to some of the southern quartzite. It is figured in Plate 2.

To turn to the neoliths, No. 4084 is a mace head of light brown colour of a pale brown rather steatoid material and is probably a pebble which has been well and carefully drilled. No. 4085 is a fine massive mace head apparently of sandstone; figured in Plate 52. No. 4086 is half a slickstone or smoothing stone, a crushed cylinder in shape with rather sharp edges, with one end gone and the remaining end carefully truncated. The material is apparently quartzite rather weathered. No. 4087 is a discoid worked flake of chert (?). No. 4089 is half of a small mace head which broke before the drilling was completed Of interest also is No. 4105, a neolithic mealing-stone of dark purple gritty quartzite, typical in shape, given to me by my friend, Mr. C. Michie Smith, Government Astronomer, Madras, who picked it up in the camp of the Total Solar Eclipse party at Sadol in 1896 or 1897. Neoliths.

CHAPTER XXXII.

CHOTA NAGPUR.

SPECIMENS COLLECTED BY THE LATE MR. WOOD-MASON, WHEN SUPERINTENDENT OF THE INDIAN MUSEUM.

This most interesting series was presented to me by Mr. Wood-Mason, a valued friend who was intensely interested in prehistorics. It consists of 17 small neolithic celts of fibrolite and slate and 7 pointed flakes of chert which he collected near Ranchi and which flakes he regarded as true worked arrow-heads, a point on which however I could not agree with him as I could only regard them as accidentally pointed flakes such as are not infrequently met with in localities where chert or agate flakes have been prepared for other purposes. I cannot see any traces of positive designed working which are so exceedingly manifest in true arrow-heads from many countries. I have already dwelt upon this strange absence of really worked stone arrow-heads and have speculated upon possible reasons for this notable fact (see *ante* p. 21). The people who could chip such exceedingly delicate little implements as some of the pygmy knives found in Gujarat and the Deccan and some of the beautiful serrated flakes and delicately finished scrapers as are to be seen in the collection could have had no possible difficulty in manufacturing stone arrow-heads had they been inclined so to do. It is hardly possible to imagine them unacquainted with bows and arrows.

Arrow-heads of stone.

The flakes Nos. 4125 to 4131 which Mr. Wood-Mason regarded as true worked arrow-heads I can only, as said above, look upon as mere accidental flakes, for none of them show any secondary working, or any attempt to give them barbs or otherwise to improve their shapes. All are made of chert. Among the possible arrow-heads of my own finding I can only mention Nos. 3892 and 43. The former of these appears to be the tang of a really worked arrow-head of chert. I found it near Umria in Kathiawar and have figured it in Plate 14. No 43 is a broad head with a transverse cutting edge of the type called "tranchet" by the French archæologists. It is made of chert and was found by me at the very interesting prehistoric site at Sawyerpuram in Tinnevelly district exposed by the removal, by Æolian agency doubtless, of part of the southern end of the great teri or red sand

dune. As possibly another example of a true arrow-head leaf-shaped in front and with a long and broad tang, but no barbs, I would mention No. 1366–62 found on Ramdurg in Bellary district and figured in Plate 11, but do not feel perfectly assured of its having been intentionally worked, and so also with regard to No. 2795 from Rawalkonda, Sindunur taluq, Hyderabad, which is made of agate, and is also figured in the same plate. Small celts.

With what object the small celts were made is a question not quite easy to answer positively.[1] They were manifestly too small to be of any use as weapons or for ordinary agricultural purposes, but they may have been toys for the neolithic children, or possibly have been prepared as miniature weapons or used for ceremonial purposes to be carried attached to slight wands as indications of rank or office. Nos. 4109 and 4111 deserve attention for good shape and careful workmanship. Nos. 4112 and 4113 were finished with rather blunt edges. No. 4115 shows instead of a sharp edge a broad blunt hammer face like a typical hammer axe. The fibrolite has taken in some specimens a very good polish and is a decidedly good-looking stone. No. 4114 shows one square and one rounded side.

That the thorn-headed arrows answered their purpose very thoroughly may have been one reason why the bow became the favourite weapon of the Aryan people, described in the Rigveda, who also practised the plan of poisoning their arrow-heads which they then made of stag-horn or bone. See Dr. O. Schrader's Prehistoric Antiquities of the Aryan Peoples. Translated by F. B. Jevons. Also *ante* p. 21.

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[1] The sharp-edged little celts might possibly have served as spuds, if fastened at the ends of handles of suitable length.

CHAPTER XXXIII.

HAZARIBAGH DISTRICT, BENGAL.

Considerable interest attaches to the two specimens which alone represent this part of Western Bengal. Both of them are of copper and formed part of a great cache of copper implements found some thirty years ago in the neighbourhood of the old Baragunda copper mine. They were very kindly given to me by my friend Dr. Saisse, the manager of the great Giridih coal mines (belonging to the East India Railway Company) when I visited them in 1887. Both specimens are figured in Plate 19. No. 4106 is a broad heavy axe-head which if well handled must have been a formidable weapon. It was probably secured to its handle by means of rings and wedges after the fashion of the laterite cutters' axes used in Travancore, as shown in the sketch facing page 63. When given to me by Dr. Saisse the axe-head was covered by a beautiful green patina which was to my intense disgust cleared off by an officious servant who had removed it from its proper resting place, with, I firmly believe, the felonious intention of selling it as old metal and would have done so but that I missed it just in time and made sharp enquiry for it when it reappeared but minus its lovely patina! The other specimen No. 4107, a large woman's armlet, had not been tampered with and remains as when I first got it.

At a big fair at Giridih I witnessed an amusing scene, a party of young women being fitted with thin bangles too small in size to go on kindly. They submitted to have their hands squeezed very severely by the vendors and were suffering such pains that they were weeping bitterly during the process yet continued to suffer for the sake of vanity. The girls were, I believe, Santhalis.

Such a painful process must have been often submitted to by the wearers of shell bangles which were often far too small to be got over a woman's hand of round size without very severe manipulation.

A Tamil poet, whose name I cannot recall, wrote about ladies of high rank laying aside their gold bracelets when going into mourning and wearing shell bangles for a time. This was an ancient custom.

CHAPTER XXXIV.

CEYLON.

At pages 250 and 251 of the Catalogue Raisonné will be found three lists of neolithic artifacts obtained in Ceylon in 1908 and which I added to my collection as I regarded them of great interest for comparison with the works of the Indian neolithic people, even though the evidence furnished may not suffice to establish an ethnic relationship between the two peoples. It proves they had some identical wants which led them to shape hard stones into tools such as scrapers and incurved scrapers wherewith to reduce to the desired thickness the shafts of their arrows, lances and javelins. Some of the Ceylon quartz objects certainly seem to be true arrow-heads, although in India the neolithic people appear to have contented themselves with vegetable substitutes such as strong and big thorns and not to have gone in largely, if at all, for stone arrow-heads.

The nearly entire absence if not total want of stone arrow-heads in India is a fact that cannot be gainsaid though scrapers, saws, strike-a-lights and flakes of many kinds occur numerously in many neolithic sites together with beautifully worked pygmy flakes and knives and prove abundantly that their makers could have produced excellent arrow-heads if they had chosen to do so. Their successors in the early iron age turned out iron arrow-heads of capital shape and workmanship.

The three lists above referred to are firstly an enumeration of neolithic artifacts collected by myself on Atgalla hill 3 miles east of Gampola after having seen the very fine collection of such tools made by my friend Mr. John Pole, the pioneer explorer of the prehistory of the mountain region of Ceylon. The specimens are marked C.A. (1–26).

The second list represents a series of quartz neoliths very kindly given to me by Mr. Pole. They are marked C.M. (1 to 29) and came from Maskelliya.

The third list represents a second series of artifacts given me by Mr. Pole who obtained them from near Matalé, north of Kandy. They are marked C (1–13).

The lists show the nature of the several objects and the special character of the quartz they are made of. The objects prepared are flakes, scrapers, strike-a-lights, piercers and possibly arrow-heads.

Similar objects have in some cases been made of coloured chert, but Mr. Pole could spare me none of these, they being made of stone rarely met with in the country.

He will, I earnestly hope, bring out a monograph of his work in the Journal of the Asiatic Society of Ceylon illustrated by his own hand. As he is a capital draughtsman such an illustrated monograph will be of great interest and value.

I quite agree with Mr. Pole as to the age of these artifacts which he regards as neolithic and not palæolithic as they were considered by the Doctors Sarasin in their great work on the ethnography of the Veddahs.

LIST
OF
PALAEOLITHIC SITES REPRESENTED IN THE FOOTE COLLECTION.

Aviyur—
No. 82. Collected by self .. .. .. Madura district.
Vanganum Kudi Kad—
Nos. 83 and 84. Collected by self .. .. Tanjore district.
Ninniyur, Udayarpalaiyam taluq—
Nos. 87 and 88. Collected by self .. Trichinopoly district.
Karadigudda, Banavaram—
No. 202. Collected by self .. .. Mysore.
Jodikatte, Tarikere taluq—
No. 203. Found by Mr. B. Shamana .. .. .. „
Talya, Holalkere taluq—
Nos. 204, 205 and 206. Collected by self .. .. „
Jyankal, Hosdrug taluq—
Nos. 207 and 208. Collected by self .. .. .. „
Nidaghatta, Sakrepatna taluq—
Nos. 209, 210, 211. Collected by self .. .. .. „
Lingadahalli, Sakrepatna taluq—
Nos. 212, 213, 214, 215. Collected by self .. .. „
Lingadahalli, north of, Sakrepatna taluq—
Nos. 216 to 223. Collected by self .. .. .. „
Nyamti, Honhalli taluq—
No. 224. Collected by self .. .. „
Kadur, south of T. B.—
No. 226. Collected by self .. .. „
Halakundi shingle fans, 6 miles south-west of Bellary—
Nos. 265a to 301. Collected by self .. .. .. Bellary district.
Beder Bellagal—
No. 302. Collected by self .. .. „
Gadiganuru—
Nos. 303 and 304. Collected by self .. .. .. „
Kurikuppa—
Nos. 305, 306, 307. Collected by self .. .. .. „
Nos. 1258—61 and 1258—62. Collected by self .. „
Kurikuppa hill—
No. 308. Collected by self .. .. „
Joga shingle fan—
No. 309. Collected by self .. .. „

Daroji—		
No. 310.	Collected by self	Bellary district.
Badanabatti hill, Bellary taluq—		
No. 311.	Collected by self	,,
Anguru, Huvinahadagalli taluq—		
No. 312.	Collected by self	,,
Hirakuravatti, high level shingle of Tungabhadra river—		
No. 313.	Collected by self	,,
Vidapanakallu—		
No. 1853.	Collected by self	Anantapur district.
Saraswatipalli, Rayachoti taluq—		
No. 2203 A.	Collected by self	Cuddapah district.
Makra-wal-palli, Rayachoti taluq—		
No. 2203 B.	Collected by self	,,
,, ,, C.	Do.	,,
,, ,, D.	Do.	,,
,, ,, E.	Do.	,,
,, ,, F.	Do.	,,
,, ,, G.	Do.	,,
,, ,, H.	Do.	,,
,, ,, I.	Do.	,,
,, ,, J.	Do.	,,
,, ,, K.	Do.	,,
North Arcot district—		
No. 2204 –1 to 5.	Collected by H. J. LeFanu, I.C.S. ..	North Arcot district.
Woodecottah—		
No. 2204—6.	Collected by self	Chingle-put district.
Attrampakkam—		
No. 2204— 7.	Collected by Dr. King	,,
,, 2204— 8.	Collected by self	,,
,, 2207— 9.	Collected by Mrs. Foote	,,
,, 2204—10.	Collected by self	,,
,, 2204—11.	(Bone). Collected by self	,,
,, 2204—12.	Collected by self	,,
Walajabad—		
No. 2204—13.	Collected by Dr. Henderson	,,
Dhone, west of—		
No. 2608.	Collected by self	Kurnool district.
Billa Surgam caves, east-south-east of—		
No. 2609.	Collected by self	,,
Vadamanu—		
No. 2612.	Collected by self	Guntur. district.
Kurichedu, north of—		
No. 2612—1, 2.	Collected by self	,,
Amravati—		
No. 2613.	Collected by self	,,

Ippatam—		
Nos. 2614, 2615, 2616. Collected by self	Guntur district.	
Gundlapalem—		
No. 2618. Collected by self	,,	
Oostapalli—		
No. 2617. Collected by self	Kistna district.	
Kaira—		
Nos. 2896, 2898 A. Collected by self	Bijapur.	
Madagi—		
Nos. 2897, 2898. Collected by self	,,	
Sadolia section, Sabarmati river—		
Nos. 3247, 3248. Collected by self	Baroda State.	
Pedhamli, right bank of Sabarmati—		
No. 3309. Collected by self	,,	
Khanmow—		
Nos. 4077, 4078, 4079, 4080, 4081, 4082, 4083. Collected by Mr. R. D. Oldham, F.G.S., G.S.I. ..	Rewah State.	
No. 4104. By exchange from the Indian Museum ..	,,	

ADDENDA

TO

THE FOOTE COLLECTION OF INDIAN PREHISTORIC AND PROTOHISTORIC ANTIQUITIES.

I.—HACKET'S BHUTRA PALÆOLITH.

Mr. H. B. Medlicott in his paper on Mr. Hacket's palæolith found in the ossiferous gravels of the Narbadā, shows conclusively that the age of those beds is quaternary, and not pliocene as stated by Dr. Falconer.

The mammalian remains found in the Bhutra section on the left (S) bank of the river (8 miles north of Gaḍarwara station on the Great Indian Peninsula Railway) are :—

Rhinoceros namadicus or *R. unicornis*, identical according to Mr. Lydekker, F.R.S., with the living species. *Elephas namadicus* is allied to the existing species of elephant, *Bubalus palæindicus* is very close to the living Indian wild buffalo, and the deer is a near relation to, if not identical with, the bārasingha (*Cervus duvaucelii*). On the other hand *Elephas insignis* and *Hippopotamus namadicus* belong to extinct sub-genera, the first being found and the latter represented by a nearly allied species in the pliocene Siwalik rocks. *Hippopotamus palæindicus* and *Bos namadicus* are not nearly allied to any Indian living species; the first belongs to a genus now only found in Africa, whilst the second although having some characters in common with the living wild cattle of India, *Bos* (*Bibos*) *gaurus*, differs from the latter in many important particulars, and appears to be quite as closely connected with the true taurine, or belonging to the type of *Bos taurus*. *Bos namadicus*, indeed, cannot be classed in the sub-division *Bibos*. The relations of the remaining mammals are less distinctly made out, the specimens on which the species are founded being for the most part fragmentary.

The only reptile clearly identified is *Emys tectum*, which is considered identical with a living Indian form. It is very singular that only fragmentary remains of crocodiles occur, for they abound in the Siwalik rocks, and a species is common in the

Narbadā at the present day. The Mollusca appear to be the same as species now living in the area, and all the commonest forms now known to occur in the river valley are represented. The following list includes only the forms determined positively.

GASTEROPODA.	LAMELLIBRANCHIATA.
Melania tuberculata.	Unio corrugatus.
Paludina bengalensis.	,, indicus.
,, dissimilis.	,, marginalis.
Bulimus insularis.	Corbicula sp. near. C. striatella.
Planorbis exustus.	

II.—ON THE AGATE FLAKE FOUND BY THE LATE MR. A. B. WYNNE NEAR PYTON, UPPER GODAVARI VALLEY.

This important palæolithic find was fully described by the late Dr. Oldham, F.R.S., in the Records, G.S.I., for 1870, and figured in Plate I in three positions.

It is an unmistakable flake knife and shows signs of use.

The animal remains found by Mr. Wynne agreed as far as they went with the specimens found with Mr. Hacket's palæolith at Bhutra on the Narbadā.

III.—PALÆOLITHIC SITES.

CHINGLEPUT DISTRICT.

South of the Corteliar River—

Pallavaram, 10 m. S.W. of Madras	Foote.
Ooratur, 13 m. S.W. by S. of Pallavaram	do.
Panjur, 4 m. S.W. by W. of Poonamalee ..	Foote Oldham & W. King.
Sriperamatur, 28½ m. W.S.W. of Madras	Foote.
Parandur Tank outflow, 8 m. N.N.E of Conjeeveram.	do.
Parandur village, 3 m. E.N.E. of outflow	do.
Tirumallavoil, 1 m. N. of, 2 m. N.E. of Avadi Station	do.
Puttur (Potur) 2 m. N.E. of Tirumallavoil, *in situ* ..	do.
Sriperamatur, W. of tank, 2 m. W. of town ..	do.
Walajabad, 12 m. N.W. of Chingleput ..	J. R. Henderson.
On the plateau S. of the Corteliar, 7 m. N.W. by N. of the Red Hills Lake, *in situ*.	Foote, Cornish & Fraser.
Quriles N.E. of the preceding locality *in situ* ..	Foote.

II. *North of the Cortelıar River*—

Tumbool, 7 m. N.W. of Tripasoore	Foote.
Attrampakkam (Numbaucum of atlas sheet) Nullah, 7 m. N. by W. of Trivel.	Foote and W. King.
Caujallum village	Foote.
Manjakaranai hill, 5 m. S.E. by E. of Vadamadurai.	do.
Devendavaucum, 8 m. N. of Trivelore, *in situ* ..	do.
Goompalayam, 3½ m. N. of Numbaucum	do.
Malandoor, 3 m. N.E. of Devendavaucum	do.
Vadamadurai (Waramderry), 4 m. S.W. of Arnee ..	do.
Errycooppum, 2½ m. W. of Vadamadurai	do.
Nelway, 8 m. N.E. by E. of Trivelore	do.

III. *North of the Narnaveram River*—

Woodecottah, 14 m. N. of Trivelore, 1 m. N. of village	do.
Sirgulpilly ravine, 2 m. W. of Woodecottah	do.
Modarimbedu, 4 m. S.W. of Sattavedu	do.
Boodoor, 2 m. S. of Sattavedu, *in situ*	do.
Caradepootoor, N.W. of Tank, 6 m. S. of Sattavedu, *in situ*	do.
Sattavedu, 27 m. N. by E. of Trivelore	do.
Panndavaucum, 3½ m. N.E. of Sattavedu, *in situ* ..	do.
Cunnumbaucum, 3 m. N.E. of Pandavaucum ..	do.
Maderapaucum, 3½ m. E. by N. of Sattavedu, *in situ*.	do.
Roshanuggur, 2 m. E. of Sattavedu, *in situ*	do.
Amarambedu, E. of, *in situ*, 5 m. E.S.E. of Sattavedu.	do.
Ingavepolliem, W. of, *in situ*	do.
Do. high ground S.E. by E. of	do.
Pallur, 2 m. S.E. by E. of Amarambedu	do.
Do. high ground W. of village	do.

North Arcot District.

I. *South of the Naggery River*—

Paliamangalam, 1½ m. S.E. by E. of Arkonam Junction	Foote.
Arkonam Junction N.W., N.E., and S.E. of	do.
Chinnamapet Station, S. and S.W. of..	do.
Do. N. of	do.
Pyanoor, 4 m. N. of Chinnamapet Station	do.
Maundoor, 4 m. N.E. of Tritani	do.

II. *North of Naggery River*—

Naikenpalayam, Trig. Station hill, W. and S. of ..	do.
Naggery town, 4 m. E. of, on N. bank of river ..	do.
Panur, S.E. of, on the crest of the pass	do.
Do. 2 m. E. of	do.
Do. 2 m. W. of	do.
Cupudoo, 7 m. E. of Narnavaram town	do.

III. *North of the Narnavaram River*—

2 miles N. of Cupudoo, supposed palæolithic Factory site.	King.

IV.—THE SPEAR-HEAD TYPE OF PALÆOLITH AND THE METHOD OF SHAFTING IT.

The first palæolith found in India was one of the spear-head type which I met with on the 30th May, 1863. It had been turned out of a small gravel pit in the laterite, a few hundred yards north of Pallavaram Cantonment (10 miles south-west of Madras). In shape it is very different from the great majority of South Indian palæoliths, being long and narrow and quite fitted to be used as a spear-head, if suitably shafted.

This in a country where bamboos grow freely was a matter of no serious difficulty. A bamboo pole of suitable size having been procured, it was easy to cut the head end off some 3 or 3½ inches above one of the joints, which would make a very good socket for the implement to be inserted and wedged in quite tight with wooden wedges, and then to tie a strong lashing round the base of the quartzite head to secure it still further.

The annexed figure is a diagram showing very clearly the position to be occupied by the stone head resting on the joint septum, as also the exact position of the lashing.

The most experienced and able writers on the subject of palæolithic weapons, beginning with Sir Charles Lyell, regarded certain specimens as of a spear-head type and in his famous book "The Antiquity of Man" on page 114 (figure 8), he gives a figure of a fine example of such a spear-head, from the Drift gravels at St. Acheul, in the valley of the Somme in Picardy.

Sir John Evans, in his splendid monograph on "The Ancient Stone Implements, Weapons and Ornaments of Great Britain" figured several lance or spear-heads of different sections of the palæolithic era. From the caves which had been inhabited, *e.g.*, Kent's Cavern, implements strongly resembling lance heads have been procured, examples of which are shown in figures 390 and 391 (pp. 450 and 451) and these may have been supplied with shafts by being inserted into a split pole and lashed. In several of the French caves extremely slender flakes have been found, with one edge quite worn away and the other untouched, a condition for which it is quite difficult to account on any other hypothesis than that of their having been inserted longitudinally into some sort of back or handle, probably of wood.

Another implement which may well be assigned to the spear-head group is Fig. 414, from the famous gravel beds at Biddenham, near

Bedford. The implement is $7\frac{1}{3}''$ long and if properly shafted would have furnished a very formidable weapon.

A very shapely spear-head, of which the original is in the Blackmore Museum at Salisbury, and regarded by Sir John Evans as one of the finest specimens found in England, is figured by him on page 491 (Fig. 423). It was found at Icklingham in Suffolk.

Another fine head is figured by Sir John Evans on page 497 (Fig. 428), from Redhill, Thetford. It is very acutely pointed "and has a thick, heavy butt, well adapted for being held in the hand." But if well shafted it would have proved an admirable spear-head. It strongly resembles the magnificent French specimen from Vaudricourt, near Béthune, exhibited at Paris in 1867. This measures $10\frac{1}{4}$ inches in length, against the $8\frac{1}{2}$ inches of the Thetford implement. An exquisitely well-shaped and most acutely pointed spear-head type of implement, is figured by Sir John on page 520, Fig. 450. It shows a peculiar but not uncommon character in ovate implements, of having the side edges forming a sort of ogee curve because not both in one plane. This curve is thought not to be intentional for any particular purpose; but to be due to the positions the implement was held in while being chipped.

It is noteworthy that this beautiful implement so greatly resembles one of the Hoxne specimens, presented to the Society of Antiquaries by Mr. John Frere, F.R.S., that in Sir John's opinion both might have been made by the same hand.

The late Mr. E. T. Stevens[1] (Honorary Curator of the Blackmore Museum and author of "Flint Chips") who had very great experience in collecting and classifying flint implements, expressed the opinion that implements of the heart-shaped sharp rimmed type, like that illustrated in Fig. 432 of Sir John Evans' "Ancient Stone Implements", were the best adapted palæoliths to be used as spear-heads, if any of the drift implements were so used. The present writer agrees with him as to the special suitability of the heart-shaped implements, but thinks other forms, which are above referred to and others yet to be pointed out, were even better fitted to be shafted.

Of the implements so beautifully drawn in Plates I and II, the forms which he judges fittest for shafting are those represented by Nos. 5, 6, 7 and 18.

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[1] Mr. E. T. Stevens' book "Flint Chips" was drawn up by him as a Catalogue Raisonné of the contents of the Museum and published in 1870. It is a very able and extremely interesting work and deservedly obtained an excellent reputation; as it deals largely with North American prehistorics, an American edition was published in the same year.

The implements which show true pebble butts were evidently meant to be used by the hand freely.

Fig. 427, from Redhill, Thetford (page 496), appears to represent a spear-head much blunted by use or accident.

Sir Charles Lyell in his "Antiquity of Man" gives a very interesting account of the discovery of flint implements of the spear-head type, in a fresh-water deposit at Hoxne,[1] in Suffolk, in 1797, by Mr. John Frere, F.R.S., a discovery of such great importance in the annals of prehistoric man that it well deserves recounting for the benefit of coming students of anthropology and archæology. The implements were found by Mr. Frere in a deposit of lacustrine origin, lying in a depression in the boulder clay. Mr. Frere states that the weapons, as he terms them "lay in great numbers at the depth of about twelve feet in a stratified soil which was dug into for the purpose of raising clay for bricks" and he gives a section of the strata. He states that shells, which he erroneously regarded as marine,[2] occurred in sand at a depth of 9 feet, together with bones of great size, and that below this in a gravelly soil the flints were found. His account is illustrated by two excellent engravings of the implements, which will be found reproduced on a smaller scale in Lord Avebury's "Prehistoric Times."

The Thames valley may claim the first recorded discovery of any flint implement from the quaternary gravels, whether in this or any other country. An implement is preserved in the British Museum, to which Sir John Evans' attention was first called by Sir A. W. Franks and which is described in the Sloane Catalogue as follows:—"No. 246. A British weapon found, with elephant's tooth, opposite to black Mary's, near Grayes Inn Lane. *Conyers*. It is a large black flint shaped into the figure of a spears point. K." This "K" signifies that it formed a portion of Kemp's collection. Many other implements have of late been recorded from the Thames valley, but they need not be considered further.

In other countries implements of the spear-head type are not unknown; their presence is, for example, distinctly indicated in Somaliland, where Mr. Seton-Karr made a large collection of implements of both flint and quartzite, many of them identical in shape with those of North-Western Europe. Among these the lanceolate or lance-head type was most abundant, though ovate

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[1] Hoxne lies 5 miles east and slightly to the south of the market town of Diss in Suffolk, on the north side of the Waveney valley.

[2] They were really fresh-water shells of the genera Cyclas, Pisidium, Valvata, Bithynia, Lim nea and Planorbis, and with them several land shells.

and other shapes occurred in considerable numbers. The implements of flint and of quartzite were almost undistinguishable. The flint in many cases was much whitened and decomposed.

That very many pointed implements were manufactured of that shape cannot, I think, be reasonably doubted, for no weapons in olden times were more valued than the spear and javelin, and they were intrinsically the most helpful to man, for they prevented the necessity of coming to such extremely close quarters with the foe, whether animal or human, as the use of the sword, or club, absolutely necessitated. Even the most backward peoples now living in the world have spears for fighting most of their enemies and also for hunting large game.

The idea that implements made with very sharp edges all round could be used with an unprotected hand is preposterous; the implement must have been used with a handle or haft of some kind, and people who were so skilful in preparing spear-heads and axes of such capital shapes as are met with so largely in England and France and other Western European countries, and less frequently but not very rarely in India, could not have found it very difficult to invent suitable handles. In countries where bamboos grow, the difficulty of providing spear shafts would have been quite trifling, and even where bamboos did not grow, many kinds of wood are found which could have furnished suitable shafts to really skilful workmen, and such were certainly some of the palæolithic people.

V.—CONDITIONS OF LIFE OF PALÆOLITHIC MAN DUE TO HIS ZOOLOGICAL ENVIRONMENT.

The palæolithic people living in England were shown by Mr. Worthington G. Smith, the author of "Man the Primeval Savage", a most interesting and admirably illustrated book, to have lived under great difficulties, because surrounded by many wild and dangerous beasts who were, not a few of them, very aggressive enemies, and had he not been really brave, and to a certain extent well armed, he would never have held his own at all against such formidable neighbours, many of whom were thirsting for his blood.

The fauna of what is now England, included then the mammoth, an elephant, a rhinoceros, a hippopotamus, the cave lion, the cave bear, grizzly bear, common brown bear, wolf, fox, hyena, wild cat, an ox, bison, several species of deer, the Irish elk and a wild horse, to mention only the large animals. To the above list yet another very dangerous and savage carnivore must be added, the great sabre-toothed tiger (Machærodus).

The above list shows clearly how hard a time palæolithic man had in Europe.

It must now be shown that palæolithic man in Peninsular India had even more enemies to contend against, and if he had remained very imperfectly armed would certainly have been destroyed off the face of the earth. The principal foes to be dreaded were (1) the tiger (*Felis tigris*) that became a man-eater; (2) the lion (*Felis leo*) in Kathiawar and further to the north; (3) the leopard, or panther (*F. pardus*); (4) the cheetah or hunting leopard (*Cynaelurus jubatus*); (5) the fishing cat (*F. viverrina*); (6) wolf (*Canis pallipes*); (7) jackal (*Canis aureus*); (8) wild dogs (*Cyon dukhunensis*); (9) hyena (*H. striata*); (10) common black bear (*Melursus ursinus*). Leaving the carnivora we must mention (11) the elephant (*Elephas indicus*), sometimes aggressive; (12) *Rhinoceros unicornis*, generally aggressive, and (13) *Sus cristatus*, not always friendly to man. Deer, antelopes and gazelles of many genera were congeners of man and from their timidity mostly absolutely harmless, but useful as affording much food; hence palæolithic man was not likely to have become a vegetarian in his diet.

Of the large ruminants, the noble bison *Bos gaurus* is very dangerous to hunters from its great strength and ferocity when disturbed. The wild buffalo (*Bos bubalus*) is about the most aggressive animal in India and a very dangerous enemy to man.

None of the Indian birds can be held dangerous enemies to man when in the hunting stage of civilization, as was the early palæolithian, though when he advanced to the stage of an agriculturist some birds became great enemies, but some others also great friends; for while the former destroyed his crops, the latter group of birds waged more effectual war against his insect enemies than he could possibly have done by himself alone.

Many members of the class Reptilia were and are among man's worst and most dangerous enemies, and these abound in India, both on land and in the rivers, foremost among them being the crocodiles, *C. porosus* and *C. palustris*. Both grow to very large size, especially the former. The Gharial is said to be less dangerous to man.

On dry land *Python molurus* was a foe much to be dreaded, for he was an ill-tempered and aggressive monster. Even more to be feared were the great venomous snakes the Hamadryad and the Cobra [*Naia bungarus* and *Naia tripudians*]. The very numerous species of Viper are all venomous, the worst of them being Russell's Viper, with very long fangs and sluggish habit, being very loath to move out of anybody's way.

People, fishermen in particular, having to go into backwaters open to the sea, and to fish in the sea close to the beach, ran great risks of being bitten by sea snakes, all of which, and there are many species, are very venomous and not unfrequently cause deaths of those that invade their haunts. The mortality due to snakes is very great.

None of the lizards or of the Chelonia appear to have been in any way hostile to man.

The class Batrachia (frogs, toads, newts, salamanders and Cæcilians) seem all excusable from any enmity to man. The class Pisces or fish includes a large number of species very hostile to man, which might in many circumstances greatly endanger his life. Among them are the many species of shark, particularly those of great size as *Carcharias* and *Zygæna* the hammer-headed shark. *Notidanus* and *Stegostoma* are both amply large enough to be fatal enemies if met with and provoked.

The idea that all the great fishes, such as those named above and others yet to be referred to, lead an absolutely pelagic or "high sea" life and never approach close to the coasts is not a correct one, for many of them do occasionally come quite close to the coasts of the peninsula and attack and kill men who are fishing or bathing in shallow waters. Several such cases occurred in the present writer's personal experience, and other cases of the same kind are mentioned by late writers on Indian ichthyology. The pelagic life rule has in fact had various exceptions within the last thirty years, during which the subject has been studied by the present writer.

Man's enemies in the sea, besides those above named, are the great rays including *Pristis*, the saw-fish, which is of common occurrence on the east coast. The west coast was probably, as has been said before, shunned by palæolithic and neolithic man, and later man also, till he had acquired iron adzes wherewith to fell the vast forest growth there occurring. *Histiophorus*, the Indian representative of the sword-fishes (*Xiphias*), is very dangerous, because unprovokedly aggressive, and is consequently greatly dreaded. It visits the south side of Palk's Bay, near Pamban.

Many other species of fish are known in the Indo-Pacific Ocean hostile to man, but their occurrence on the Indian coasts has not been recorded in any accessible work; they cannot therefore be referred to at present.

Of the class Mollusca, the only dangerous enemies of man are the very large octopuses. Whether any of them have been met with on the Indian coasts has not yet been stated in any publication known to the present writer.

Of the class Arachnida man had many species of scorpions, large and small, to contend against, and the stings of the large kinds are sometimes fatal to infants and weak old people. The genus *Galeodes* and some of the large bird spiders are also much dreaded, yet their bites are not often fatal, though they cause great temporary suffering.

The class Insecta includes many genera and species which, if not actually fatal to man's life, are yet capable of doing him grievous injury and producing terrible suffering, for instance, the many kinds of wild bees, wasps and hornets, which attack man not unfrequently and often in places where escape from them is impossible. Stinging and biting ants are also very trying neighbours. Of the Insecta which are to be considered as enemies to man, by causing or spreading disease, the mosquitoes take the first place and next to them fleas and flies. Of the Lepidoptera a number of caterpillars, possessed of stinging hairs, often cause great torture, and where a large surface of the body has been affected have been known to cause death. Among the Coleoptera or beetles, very distressing local inflammation and intense suffering have been often caused by the accidental crushing against the human body of *Cantharides* (Spanish flies).

Of the Hemiptera, the bugs, large and small, are very aggressive and are capable of causing great discomfort and actual severe pain.

Myriapoda contains many species of centipedes which are highly aggressive, and whose bite is as painful and as serious to man as the stings of the scorpions already referred to above.

The last enemy of man that need be mentioned here belongs to the class Nematoda and is the justly dreaded guinea worm (*Dracunculus*), which gets into the human body either by being swallowed in impure water, or when the person is bathing. If the worm breaks in the process of winding it out, it causes a bad abscess or a succession of such, and if not properly managed may cause blood poisoning and lead to death. The extreme pain caused by the abscesses may lay up even a strong person and cause serious illness for a considerable time. The writer speaks from experience.

The above list of man's tropical enemies proves abundantly that early man in India was exposed to many more dangers than was early man in Britain or Western Europe, in palæolithic or neolithic times. In addition to the above list of fishes that attack and kill man, it should be remembered that several of the bright gay-coloured coral reef fish have very poisonous flesh and should never be eaten. Other fish have poison organs on their dorsal spines, as for example the *Synanceia verrucosa* of the Indian

Ocean, which lies concealed in the sand, and if trodden on with naked feet has often caused the death of people wading in the sea.

The wounds caused by the caudal spines of the sting rays, *e.g.*, *Aetobatis narinari*, are very serious, intensely painful and end in some cases in gangrene. Wounds are also caused by the spines of Siluroid fish.

VI.—CONNECTION OF THE PRADAKSHINA FUNCTION AND THE SWASTIKA SYMBOL.

On page 73 I described the only example of the Swastika symbol that occurs in my collection, and pointed out that it was by studying Count d'Alviella's learned treatise on that very interesting, and by many much venerated ancient symbol, that I felt assured that my specimen[1] bore strong resemblance to the Trojan type of Swastika. There is an obvious connection between the Swastika and the very ancient Indian service or function known as the Pradakshina, often performed by childless women desirous of getting a family, who at certain temples walk in a circle while praying for a blessing and accomplishment of their earnest wish.

Certain localities obtain a reputation for the frequent answering of these prayers and are much resorted to in consequence.

One such place is situated on the southernmost and highest peak of the Bababudangiri Mountains in Mysore. This peak, locally known as Mulainagiri, is 6,317′ high and commands a grand panorama on all sides but the absolute north. It was visited by me when mapping the geological features of the mountain mass. As we sat on the summit, our attention was attracted by a small number of young women doing the Pradakshina with intense devotion on a small platform, a little below our seat. They finished their perambulation very shortly and then went into the temple courtyard and there met with a sight that filled their hearts with great joy, as they regarded it a perfect good omen that their prayers would be heard. The sight which charmed them so greatly was a favourite little dog of mine lying in a small box and suckling four tiny pups, and their joy at this sight was simply touching to see.

VII.—THE EAST AND WEST COAST LATERITES THE RESULTS OF A PLUVIAL PERIOD.

When I wrote, in 1864, my first paper on the palæolith-bearing lateritic beds of the East Coast, I was strongly impressed with the

[1] No. 252–62, Plate 36.

idea that they must be regarded as of marine origin, though this involved the difficulty of accounting for the absence of marine fossils in the ferruginous clay. No other preferable idea was offered by any one else, though my supposition was not generally accepted. Sir John Evans' hypothesis that the beds had been formed by a great river flowing parallel with the present coastline, was not accepted any more than mine, because it failed to show the presence of any sea-side barrier compelling such a course for the river.

I continued to hold the marine theory for many years, though not really satisfied with it, but lately after much study of various papers by different authors, none of which I have found cogent, I have formed a new theory which, I venture to think, will account more successfully for many of the difficulties my original theory did not meet.

My new theory is that the great shingle and clay deposits covering such large areas of the eastern low country, were formed by and during a great pluvial period, which synchronized with the great pleistocene ice age, which caused so vast an extension of the snow fields and glaciers on the Himalayas and other mountains of the north. The tremendous rains, which fell during the pluvial period, flowed off the land in vast floods, far exceeding ordinary rivers in column, and it was these floods that swept the shingle of the old Rajmahal conglomerates of Jurassic age, eastward into the low country of that date. With the shingle the flood waters carried also numbers of palæoliths, many of which show a great amount of attrition, while others present but very little or none at all, according to the distance they had travelled. This vast discharge of fresh water into the sea of that period, had doubtless the same effect on the marine fauna, but on a vastly larger scale, as excessively heavy south-west monsoons have been observed to have off the west coast of the Peninsula; namely that of killing immense numbers of sea fish, on whom the influx of abnormal volumes of fresh water has a quasi-poisonous action. The strong currents set up by the long continued influx of rain water, swept all the dead marine animals far away from the coast, so that they sank in deep water, there to become fossils which will remain unknown and unseen, unless some vast geological upheaval were to take place and convert into dry land tracts of the sea bottom now covered by deep water.

The sources of the immense quantities of ferruginous matter required to make the lateritic spreads on both sides of the peninsula, of various ages, are many, the eldest being the magnetic iron beds of gneissic or archæan age, great numbers of which, many of large size, occur in the Salem and Trichinopoly districts, and

smaller ones in the Northern Circars (Guntūr district). The Dharwar rocks in western Mysore, central and western Bellary, and eastern Dharwar district, and the south-western corner of the Hyderabad State contain many large beds of hæmatitic quartzite. The youngest series of deposits occurs in the Deccan Trap area, in which many flows are richly charged with grains of magnetic iron, *e.g.*, in the Mudhol State.

That the pluvial downpour had a similar effect on the west coast, seems to be clearly proved by the non-finding of any fossils in the very numerous diggings in the coast laterite, which is so largely quarried in Travancore, Cochin, Malabar and South Canara as a building stone.

In a country like peninsular India, where there are so few caverns and good rock shelters, man must have had a very bad time during the continuation of the pluvial period and very probably died out very largely or altogether. The land fauna of the pluvial period must also have suffered very greatly, especially such members of it as habitually resorted to underground habitations, in which they would be constantly liable to be drowned. How this may happen is clearly explained in Addendum VIII, dealing with Stephen Hislop's theory of the formation of regur or black cotton soil. One cause of the absence of fossils in the coast laterite, must have been the corrosive action of ferric hydrate, which gives a red colour, and is very destructive of organic remains.

A study of the many detached outliers of laterite, occurring on the Mysore tableland to the north-east of Bangalore, proves clearly that they are of sedimentary lacustrine origin, and this establishes beyond controversy the existence of a large lake, in which this extensive deposit of laterite was formed, and afterwards cut up into the many small outlying plateaus by subaerial denudation.

This important lake has been well worked out by Mr. E. W. Wetherell, in Part I of Vol. III, of the Memoirs of the Mysore Geological Department. A clear little map shows the ascertained shore line of the lake.

At page 3 of his paper, Mr. Wetherell states that I regard all high level laterite as simply the alteration, *in situ*, of various forms of various kinds of rock, especially of basalt, by the action of atmospheric changes, but he does not quote the passages in which I have made that statement and I cannot tax my memory with having made such a sweeping one. In my memoir on "The Geological Features of the South Mahratta country and adjacent Districts,"[1] I have given, what I think is a good and safe reason, why the uppermost flow of the Deccan Trap did not

[1] Memoirs of the Geological Survey of India, Vol. XII, Part I, 1876.

become amygdaloidal, and for which reason the pure basalt it consisted of, could on decomposing from atmospheric influence pass into a pure iron clay. The uppermost basalt flow being the conclusion of the great volcanic era, no other formation came to overlie it, and so no water having silica in solution could flow into the basalt, to fill any possible vesicular or bubble cavities and convert them into amygdala, and geodes.

On the Amboli and Phonda ghats, the former near Belgaum and the latter in the south of Kolhapur State, occur some of the best sections, showing the passage by subærial decomposition, which are specially well seen where the great military roads have been cut rather deeply into the rocks they cross.

The laterite in the immediate neighbourhood of Bangalore, is certainly a high level laterite and unmistakeably lacustrine in origin, and its existence on the Mysore plateau appears to me to be a strong proof of the correctness of my postulate made above, that a great pluvial period must have happened, to have produced the great coastal sedimentary deposits now to be seen on either side of the peninsula, and the several large lakes met with in various parts of the Deccan, such as the Hoskote lake of Mr. Wetherell, near Bangalore, and those that I have pointed out in my memoir on the South Mahratta country above referred to. There can, I think, be little doubt as to the existence of four lakes south of the Kistna river, three of them near Kaladgi, in the centre of what is now the Bijapur district. The most easterly of the three I will call the Bayal Kot lake, the most northerly the Sita Dongar lake, from the Sita Dongar hill which forms its eastern boundary, and to the most westerly which lies west of Kaladgi town I will give the name of the town.

The fourth lake lies eighteen miles further south, on the north side of the quartzite ridge which forms the southern boundary of the Kaladgi system of rocks. I will call this the Badami lake, after the important town of that name which lies 10 miles to the east of it. These lakes appear all of them to have been formed by streams flowing eastward.

VIII.--HISLOP'S THEORY OF THE ORIGIN OF REGUR OR BLACK COTTON SOIL.

The theory of the origin of regur, propounded by the Rev. Stephen Hislop, a zealous missionary in Nagpur, and a very able geologist, has been accepted by, I believe, all the members of the Geological Survey of India, and many other geologists that had

occasion to study this very remarkable soil, which plays so important a part in the Indian Peninsula and surrounds nearly all the castellated hills in the Deccan (see section 6 of the general notes, p. 27.)

Hislop's theory may be stated briefly to be the following: the regur or regada (Telugu) is of subærial origin, and resulted from the existence of luxuriant forests not subjected to the destructive action of annual fires, and which therefore in time caused a rich humus to accumulate and enrich the subjacent soil with its organic matter. The capacity of this soil for absorbing moisture and retaining it, is the source of its great fertility, and the continuance of such fertility for long periods is due to the action of violent thunderstorms in the hot season, when the torrents of rain flood the surface and wash into the gaping cracks of the regur immense quantities of vegetable matter lying on the surface, and many small animals such as rats and mice, lizards, snails, and multitudes of insects, and with them much loose soil. The violence of these thunder showers must be seen to be realized. The very slow rate of progress enforced on a regur plain by such a rain storm, enables the traveller to observe the effects produced very thoroughly. At the end of the cloud bursts, which such storms really amount to, all the fissures except a few of the very largest have disappeared, being filled up.

I experienced two such tempests while working in the Bellary District, so can speak of actually seeing their effects. Lizards and other small animals, and immense numbers of insects of many varieties, and vast quantities of vegetable matter were washed down into the gaping fissures, which were soon filled up and the washed in objects securely buried.

IX.—THE DRAVIDIAN RACES.

According to the late Sir Herbert Risley, the Dravidian peoples are autochthons of the Deccan and the south of the Peninsula, now numbering some fifty millions; but according to Col. Sir Thomas Holdich, they were immigrants from the direction of Mesopotamia, who passed into India by the Makran gate, leaving behind them the Brahim tribe in Southern Baluchistan.

They are certainly not Mongolioid in their appearance. Might they not possibly be representatives of the brown race described by Prof. Elliot Smith, F.R.S., in his learned and yet charming little book "The Ancient Egyptians?"[1] Could they not be a

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[1] Harper's Library of Living Thought.

branch of that race which migrated eastward, before the invention of the copper axes which enabled the Egyptians to subdue so many of their neighbours? The copper weapons were certainly unknown to the early Dravidians in South India who, it would appear, lived in a purely neolithic time, for in several hundred neolithic sites that I examined closely I found not the ghost of anything made of any metal whatever.

Only from one site did I obtain any copper objects and these were a gift from an esteemed friend Dr. Saisse, the very able Manager of the East India Railway Company's coal mines at Giridih, in the Karharbari coal-field in Chota Nagpore. They formed part of a very important cache of copper objects found in the neighbourhood of the great Baragunda copper mine. The two specimens Dr. Saisse gave me are numbered 4106 and 4107, and are a broad axe head and a woman's armlet respectively, and both are figured in Plate 19. Further particulars about these copper implements are given on page 164.

The Catalogue of Mr. Rea's finds in the Tinnevelly district not having been published as yet I cannot, unfortunately, refer to it, and my memory will not serve me safely as to the existence of any copper implements in it. Of bronze implements and ornaments there are, if I remember rightly, after a lapse of several years, various good examples.

I hope to be able to get hold of information as to the craniology of the Deccan people that will throw much light on this obscure point.

X.--ELEPHANT-SHAPED FUNEREAL VASE FROM THE LEFT BANK OF THE TUNGABHADRA RIVER.

On the left bank of the river, opposite to the town of Hampasagra (in Bellary district), I came across a neolithic burial-place, where a number of graves had been greatly injured by a heavy flood of the river, which must have happened not very long before the time of my visit, to judge by the appearance of the ground. Several of the graves had been washed out, and their former contents strewn over the slope to the north-eastward. This funereal vase No. 2886/7 is a four-legged vessel whose shape will be better realized from an examination of plate 64, than from any mere verbal description that could be given. My attention was drawn to the fragments of the urn by the columnar shape of the four legs, which at once suggested that the vase when entire must represent an elephantoid quadruped, which was of considerable help in searching for the fragments which were scattered far and wide over a very considerable area. This

area was very closely searched by my wife and self, in quest of the animal's head which was missing and unfortunately could not be found, though we devoted many hours to the hunt, a whole evening and a long morning the next day. It had probably been buried under a sand drift of which there were many. Excepting the head and three or four small pieces of the body, the whole vase or urn was recovered and eventually built up for me by my friend Mr. R. F. Carey of Yercaud, who devoted much skill and immense patience to a very difficult piece of work. The difficulties he encountered have already been dwelt on in Chapter XIX, in which two other finds of great interest made at the same time are referred to, Nos. 2886/6 and 2886/5.

The graves themselves were rather remarkable, for they do not answer to any definitely named class of graves, but are really *sui generis* and form long low mounds closely bordered with stones less than a cubic foot in dimension. The dimensions of the vase in inches are as follows: height $11\frac{1}{4}$, length $10\frac{1}{2}$, width of body $8\frac{1}{4}$, height of legs $4\frac{1}{4}$, length of oval lid 4, width of lid $3\frac{7}{8}$, circumference of base of right fore-foot $8\frac{1}{2}$.

The tip of the tail is broken off.

XI.—CARVINGS AND DRAWINGS BY PALÆOLITHIC ARTISTS.

The ancient portraits of man drawn by his contemporaries in palæolithic times, are not numerous nor by any means to be reckoned among the best artistic performances of that era, for they are greatly inferior in merit to the drawings and paintings of animals produced about the same period; many of which deserve much commendation for their good drawing and the spirited attitudes represented, which clearly show the intimate acquaintance of the draftsmen with the animals they represented.

Professor Sollas has grouped together on one page of his delightful book, "Ancient Hunters" (page 341), four of the most remarkable drawings extant of palæolithic man, by probably contemporary artists:—

1. Hunter stalking a bison, on reindeer horn, Laugerie Basse.

2. A man with a stick on his shoulder passing in front of two horses, on a fragment of a "bâton", La Madeleine.

3. A young man with a very pithecoid face and head, from Mas d' Azil (on bone).

4. La Femme au renne, a rude hairy woman, headless and enceinte, Laugerie Basse (on ivory).

A notable carving in reindeer horn representing a man's head, full face, found by A. de Mortillet in the Grotte de Rocheberthier and given by Professor Sollas in "Ancient Hunters," p. 342, shows a very funny expression of the mouth and very steeply oblique widely open eyes. It is specially noteworthy, because apparently the only known attempt to figure man's face in full, all others representing him in profile.

As said above the portraits of animals in many cases deserve much higher commendation than those of palæolithic man. Why this should be seems to demand some explanation. An obvious one is the superstitious dislike and fear felt by half-civilized people, that if they are drawn the artist obtains a quasi-magical power over them, and can work evil against them by means of their portraits. The artistic tribesmen therefore had difficulty in getting models from whom to study the human figure. This feeling is still found among the lower class in various parts of South India, and I have various times made use of it to drive away unwelcome crowds from my tent door, by producing a sketch book and beginning to draw some of the loiterers. To return to the animal portraits, a few of the best quite deserve to be cited and have references to illustrations of them given, to allow of their being looked up by students of the subject. By many archæologists it is thought that the best animal portrait is that of the "grazing reindeer" found in the Kesslerloch cave at Thaingen, near Zurich. It is engraved on reindeer horn. It has been figured by Professor J. Heierli in his "Urgeschichte der Schweiz," p. 50, in its natural position, *i.e.*, with its legs not shown because of the curve of the horn on which engraved. Professor Sollas gives ("Ancient Hunters," p. 338) a *facsimile* of the carving as if on the flat, unrolled in fact. The Kesslerloch cave yielded other capital drawings of a horse or foal, also on reindeer's horn and besides these a very interesting carving was found representing the head of a musk ox, figured by Professor Sollas in "Ancient Hunters". It may be noticed that the muzzle of the figure has been broken off, but that does not injure the likeness very greatly.

A very spirited figure of a reindeer running at top speed, taken from an engraving on hornblende schist, found at Saint Marcel is given by M. Breuil in "L'Anthropologie" and reproduced by Sollas on page 339 of "Ancient Hunters."

Two beautiful sets of chamois heads, drawn and engraved on the tines of an antler, found in the cave of Gourdan, Haute-Garonne, France, are given in the Encyclopædia Britannica, (eleventh edition), Vol. 20, article "Painting," Plate I. The author of these drawings must have been intimately acquainted with the animals to have rendered their features and attitudes so

accurately. Interesting rock engravings of varying artistic merit were found at several of the caves in central France and these may be mentioned here briefly to assist those who wish to go further into the study of these most attractive examples of ancient art.

Although no engravings or drawings on bone, antlers or ivory, such as those found in the French and Swiss bone caves have been met with as yet in India, it would be unsafe to conclude that none had been produced by the old people who were possessed of burins, or engraving tools, similar to those used by the palæolithic artists who drew the wonderful pictures of man and his contemporary animals referred to above. Similar drawings may have been made by the Indians, and have been destroyed by those ubiquitous destroyers of many human artifacts, the termites, which are known to have attacked and damaged human crania in ancient Egyptian graves. It is by no means unlikely that the Indian insect ravagers may have done the same, and have annihilated the carvings and drawings made by the old people in this country on bone and ivory. Some fortunate explorer may yet come upon some of the Indian artists' works, that have escaped the termites by being buried in white ash, as happened in the case of Mr. Cornelius Cardew's wooden comb, found in his excavations at Guntakal.

XII.—THE ALTAMIRA CAVE PAINTINGS.

One of the most remarkable archæological discoveries ever made, was that of the marvellous series of paintings of animals on the roof of the Altamira cave near Santander, in 1879, by Don Marcellano de Sautuola and his little daughter. It was an extraordinary revelation of the great artistic power and taste of the neolithic people of the Aurignacian stage of civilization.

The great group of paintings represents some 26 or 27 different animals, mostly bull bisons, one cow, a mare and foal (?), two deer (short-horned) and two wild boars, one charging furiously. This boar forms the extreme right hand figure of the group and his action is wonderfully lifelike and capitally drawn. Of several of the figures the outline had been cut lightly into the rock before the painting was begun.

It may be asked, why say so much about the cave paintings when none have yet been found in South India, though a number of caves have been very carefully examined in the hope of finding mural pictures. The answer to this query is that some of the Indian palæolithians may have had artistic tastes,like the people

that made the rock bruisings on the face of the trap dyke on the scarps of Kupgal hill in Bellary district (see pp. 88–89).

That the neolithic people used burins or graving tools, is proved by the fact that such tools have been met with here and there in the Deccan, while one of typical shape found near Jabalpur (No. 4055, Plate 12) is in the collection. These tools were not made for nothing, so we may very possibly find further objects prepared with their aid, besides those in the collection, viz., the Valimukkam pendant No. 74 (page 52 and Plate 46) and the Maski conjuring staff No. 2739 (page 125 and Plate 47).

It is, I think, far from improbable that other caves than those already known and referred to above, as the Billa Surgam and Yerra Zari Gabbi groups, may exist in the great limestone regions of the Cuddapah and Kurnool systems and their more westerly equivalents, the Kaladgi and Bhima series. Search should be made all over those limestone areas for caves that were unknown to the geological surveyors, for they had to get over such large tracts of country at great speed, that they may easily have missed caves in thickly-jungled valleys, and many even important caves may be unknown to the local natives. Caves may become hidden to a strange extent, by the falling in of the rocks over their entrance or mouth.

That the old people might have possessed pigments, wherewith to produce coloured paintings if they desired to do so, is a well-known fact, and in several places many varieties of coloured clays and ochres occur in large quantities.

A very interesting example of such a site occurs along the west boundary of the Dharwar rocks, which are exposed in the scarp of Ramandrug hill, in Bellary district. The series of coloured clay schists here met with, contains examples of red of several shades, green dark and light, blackish and other intermediate tints.

To return to the Altamira cave paintings, Prof. Sollas gave a capital account of them in "Ancient Hunters", where the story of the find of the wonderful group of paintings is graphically told and rendered very comprehensible by the many illustrations given.

XIII.—ACCIDENTAL FORMATION OF BULBS OF PERCUSSION.

The idea that a bulb of percussion on any siliceous or other hard stone, is absolute proof of its having been made by man, an idea entertained by many interested in prehistoric archæology,

is one which should not be kept up, as that very peculiar form of fracture may be produced by accident. Of such accidents I met with several striking demonstrations, when working along the east foot of the Velikonda mountains, in Nellore district, in 1875. Much of the lower slopes is there covered by great spreads of quartzite shingle, thinly grass-grown.

Large herds of cattle feed on this grass, and several times when I came across such herds they took fright and stampeded violently, and in so doing kicked up much shingle which impinged heavily on stationary pieces, and there produced capital examples of very typical bulbs, often of large size.

I have often regretted, since then, that I did not collect some of the cattle-made bulbs, for exhibition and comparison with others intentionally produced by palæolithic man when manufacturing his artifacts.

XIV.—NEOLITHIC FINDS NEAR KODIAR MATA WATERFALL.

Three miles north-east of Dhari, the Shetruji river makes the picturesque waterfall sacred to Kodiar Mata, and immediately east of the fall rises a good sized hill from the upper part of which I procured the specimens No. 3906, a red and green flake of bloodstone, No. 3907, a core of green bloodstone showing five flakes, and No. 3908, a selected stone of pale yellowish green and green chert.

Anybody travelling in that part of the Dhari Mahal should make a point of visiting both the fall and the hill beyond it, for the fall is intrinsically very picturesque, and the fine view from the top of the hill is of great assistance in helping to a correct understanding of the geological structure of the country to the north and east.

XV.—CAVES TO BE SEARCHED FOR IN THE GREAT LIMESTONE AREAS OF THE KURNOOL, CUDDAPAH AND DHARWAR SYSTEMS.

It is quite within the bounds of probability that other caves may exist in the above-named limestone areas, beside the small number occurring in the Kurnool district and the Banganapalle State, which all lie close together to the south-west of Nandyal town. The principal one of the group, the well-known Billa Surgam cave, was discovered by the late Captain Newbold, F.R.S. He was the first to bring to the notice of European scientists the fact of this cave being ossiferous, the first of the kind known in India. He obtained a number of fossil bones, but

they appear to have been lost and never described, and nothing was done till Professor Huxley asked Sir M. E. Grant Duff, then Governor of Madras, to move in the matter. In consequence of this I received instructions to proceed to the Billa Surgam cave to make excavations and procure a fresh set of the fossil bones. I accordingly proceeded to Banganapalle, in 1884, as the nearest town of importance from the cave.

I was unacquainted with Captain Newbold's work and could not locate the Billa Surgam cave exactly, for it was not shown on any map that I knew of, and the information as to its real situation which I did receive was quite wrong; hence I began work at a large cave locally called the Yerra Zari Gabbi and met with no success. My eldest son Lieut. H. B. Foote, R.A. (now Lieut.-Col.) was with me being on leave. After several weeks' stay I heard casually of another and larger cave several miles to the northward, so we rode over there and found that it was really the true Billa Surgam. I moved my camp over there at once and immediate success rewarded our search.

Besides the bones of the extinct and existing animals found in the several chambers of the great cave, a number of prehistoric objects were found by Lieut. Foote, which appeared to me, when I studied them, to be of Magdalenian type. These included *inter alia* specimens of pendants made of teeth, and other artifacts made of bone to be noted again further on.

No palæoliths were found in the caves, but a greatly weathered "boucher" of very gritty quartzite was found by me just outside the mouth of a small cave opening to the eastward, about a quarter of a mile east by south of the great cave.

The finding of the Magdalenoid artifacts, just referred to, shows that in our present state of knowledge the history of the country south of the Gangetic valley is divisible into two periods, the lower of which corresponds with the Chelleo-Mousterian of the French archæologists, and the higher with that of the above-named Magdalenoid objects. Except the two stages of the palæolithic age above dealt with, equivalents of no other sub-divisions of the great era have been recognized in India, and it remains to be seen whether future researches will necessitate the establishment of any further sub-divisions.

XVI.—SITES IN WESTERN ASIA THAT HAVE YIELDED PALÆOLITHS AND NEOLITHS.

Very little appears to be known about the former inhabitancy of Western Asia by palæolithic peoples, but the occurrence of palæoliths has been noted here and there in a few places by

travellers, and a short list of such finds is given below, but North Arabia, the whole of Persia, and the tract between Persia and the valley of the Sabarmati in Gujarat, seems to be a *terra incognita* to prehistoric archæologists, and till it has been carefully examined, we must remain in ignorance on many points concerning the individuality of the successive peoples which occupied that region.

The following is a brief list of finds of implements made in Western Asia:—

(1) A palæolith (?) found on the surface of a bed of gravel between Mount Tabor and Lake Tiberias, which was exhibited by the Abbé Richard, at the British Association in Edinburgh, in 1871.

(2) Another palæolith found at Bethsaram, near Bethlehem, by Monsieur Vogne.

(3) A palæolith found near Jerusalem, by Mr. Stopes, F.G.S.

(4) A palæolith found by Mr. Ghantre in the valley of the Euphrates.

(5) At Abu Shahrein, in South Babylonia, several implements are reported to have been found, and these were probably of neolithic age.

XVII.—MORE EXACT LOCATION OF SEVERAL SMALL SITES (NAMED ON PAGES 128 AND 129) IN HYDERABAD STATE.

While exploring the Billa Surgam caves in Kurnool district in 1884, in company with my son Lieut. H. B. Foote, R.A., I was ordered to proceed expeditiously to the Singareni coal-field, to meet an official from Hyderabad who would show me maps of the coal-field as far as then examined. Proceeding *via* Bezwada and Nandigama, I marched up the valley of the Munieru (Moonyair of Indian Atlas, sheet 75), and in the many traverses made in examining the country on either side of the proposed railway, from the coal-field to Bezwada, I came across neolithic celts at the following places:—

(1) Matur, No. 2889	4 miles N.E. by E. of Maddire (Muddeera of I.A., sh. 75).
(2) Between Motunnurri and Byavaram, No. 2890.	3 miles N.N.W. of Maddire.
(3) Jirlacherru, No. 2891 ..	8 miles west of Khammamett (Kummummett of I.A., sh. 75).
(4) Harur (Urroor of I.A., sh. 75), No. 2892.	15 miles S. E. of Bonagiri.
(5) Poolloygoodahs (polishing groves).	21 miles E.S. E. of Bonagiri.
(6) Mustellapalle, No. 2893.	9 miles east of Bonagiri.

XVIII.—PALETTES OF THE PALÆOLITHIC, NEOLITHIC AND EARLY EGYPTIAN ARTISTS.

The palettes used by the prehistoric artists would appear to have been bovine scapulæ or shoulder blades, examples of which have been found still covered with the red ochre they put on walls and roofs of caves that had been decorated.

Among the great variety of art objects produced by the early Egyptian artificers, were a large number of artifacts carved out of hard slatey schists. The variety of forms into which these so-called palettes were shaped is very remarkable, for they cut them into likenesses of birds, beasts and fishes of the most varied outlines. Besides giving them such varied outlines, many of the more highly elaborated ones were carved all over with complicated and often picturesque devices, some of which represented quasi-historical or legendary scenes. Some of the finest examples, which are highly artistic, may be really historical records, because it would seem very improbable that so much time and labour would have been bestowed on unreal events. An excellent selection of these so-called "palettes" is figured and described in a very able and capitally illustrated French work on Egyptian antiquities, by M. Jean Capart, Joint Conservator of the Egyptian antiquities in the Royal Museum at Brussels, and Lecturer in the University of Liége. The title of the work is "*Les Débuts de l'Art en Egypte.*"

No such decorated palettes appear to have been produced by the Indian prehistoric artists, but further research may yet light upon something approximating to them.

Indian prehistoric pottery has not, so far as I have been able to study it, produced vases made in the shapes of birds, and only one in the shape of an animal is known to me. This is a funereal urn in the form of an elephant, which I have described fully with a figure in addendum No. X. It was first drawn attention to in chapter XIX, on the finds made in the Hyderabad State, but that notice required to be amplified.

XIX.—MOULDING AND CASTING OF POTTERY.

The preparation of earthenware structures, such as hut urns and other angular forms, demands the pressing of the moistened clay into moulds. This process of moulding was one which had been discovered prior to the invention of the potter's wheel, and so had seemingly been the process of casting vessels, which consists of pouring thick "slip" into a hollow mould, and allowing it to acquire a sufficient consistency to admit of its being removed from the mould without deforming it, before placing it in the kiln.

The pressing of the damp clay into an open mould is a perfectly easy process, if the clay is prepared to a proper degree of tenacity and a suitable temperature maintained during the performance.

XX.—OKHAMANDAL MAHAL, OR THE DWARKA COUNTRY.

This tract of country, forming the extreme western extremity of the Kathiawar Peninsula, afforded but very few additions to the list of prehistoric artifacts collected by me. Only one appeared worth figuring, and that is No. 4045, given in plate 16, a die made of calcareous grit and remarkable because oblong in shape, instead of cubical. Some educated native gentlemen at Dwarka, to whom I showed it, were much interested to see a die made of stone. It is said that the Rann of Cutch was once a gulf of the Indian Ocean, with seaports on its shores, and that the remains of ships have been found imbedded in the mud. Dwarka stands on ground which not very many years ago was an island, but a lofty sandhill, thrown up by the joint action of the surf and the prevalent west wind, joined the southern end of the island with the mainland to the south, and shut off the lagoon on the eastern side of the island from the sea, and it only joins the latter northward in the Gulf of Cutch. The eastern side of the island is broken up and cliffy, and quite picturesque, the strata being gaily coloured, light red and pinky beds of sandstone and hard loam being common.

A zoological fact which should be recorded is the much smaller size of the chank shells in the Gulf of Cutch, than that of those met with in the Gulf of Manar, where the chank shell fishery is quite an important commercial undertaking. Another noteworthy fact is the very injurious action of the violent west wind, so prevalent near Dwarka, on all trees not protected by the shape of the ground or by high buildings. Their tops, where unsheltered, assume the shape of large crook-handled sticks pointing to the east.

XXI.—KILNS FOR BURNING POTTERY NOT KNOWN IN THE EARLY PART OF THE NEOLITHIC AGE.

In the article on prehistoric pottery forming section 7 of the general notes on my collection, I pointed out that no ancient pottery works on an important scale had been met with by me in many traverses through the Deccan and adjoining parts of Southern and Western India, and that it was possible the early

neolithians of India may not have constructed kilns, but have burnt their wares in open fires, as was done by other contemporary peoples.

A strong argument in favour of this idea is provided by the appearance of many good vessels which are black at top, but pass down into red. The black part is imperfectly burnt and the red, if a bright red, thoroughly well burnt.

The superior quality of the well-burnt earthenware over that imperfectly burnt, is illustrated by the condition of specimens of both after exposure to weather action, and still more by the effect on both of immersion in strong brine. A striking case of this was noted in an intensely saltish stream, a little west of the great iron slag mounds of Vasravi, in the Velachha taluk, Baroda State. Under the water I noticed a very large black bowl which I tried to lift up, but it crushed into a mud-like pulp leaving only a piece of the rim entire, which I have figured in plate 39. It is numbered 3315*a*.

Another well-marked case of the corrosive action of strong brine on black pottery was met with at a pottery site in Jetpur State (Kathiawar). This site lies on a low rising ground, eastward of Kankawao railway station, and east also of an old ginning mill. The pottery here found was of a type quite *sui generis*, but somewhat resembling that found at Dhalkania in Dhari Mahal. In a small intensely brackish stream I found the conical lid of a small black vessel (not met with) very highly corroded, though fragments of red colour were not affected. This lid corresponds closely in shape with No. 1516*a* found at Sindavallum in the Bellary district.

XXII.—TERMITES IN THE IRON-AGE IN MYSORE.

At page 103, I described the only specimen of neolithic wood work that I knew to have escaped the greed of the white ants, a comb found by my friend Mr. Cornelius Cardew at Guntakal railway junction (in Anantapur district), and the fortunate cause of its escape from these ravenous insects.

Later on, when arranging the prehistoric collection in the Madras Museum, I came across a specimen of the iron age in which, though termites had eaten the greater part of a spearshaft they had not quite completed its demolition, and for some reason or other had left a small remnant of the wood in the spear-head socket. The wood shows the peculiar surface left by the action of the termites' jaws, a surface quite characteristic of their work.

XXIII.—INDICATIONS OF THE GLACIO-PLUVIAL PERIOD IN INDIA.

The evidences of alteration of level along the sea coast, point to a slight elevation of the land during the pleistocene period, but of too small an extent to have had any appreciable effect on the climate.

This is important in its bearing on the evidence that exists of the cold of the glacial period having been felt in the Indian peninsula. There is no physical evidence, so far as is known, of a geologically recent cold epoch, and some geologists have doubted whether the peninsula was affected by the glacial period; but it does not appear hard to understand that a period of great cold in central and northern Asia, was in the south represented by a very wet period, a really pluvial epoch which was characterised by the formation of the great lateritic deposits of the east and west coasts of the peninsula.

In the Himalayas there is everywhere abundant evidence of the glaciers having extended to lower levels than they now reach. Graved and polished rock surfaces are found now at as low a level as 7,500 feet in Pangi, and in a higher latitude large boulders have been found imbedded in the fine silt of the Potwar, at an elevation of less than 2,000 feet.

The cause of the interglacial hypothesis has been most ardently championed in England by Professor James Geikie, who has endeavoured to show that there were in Europe six distinct glacial epochs within the glacial period, separated by five epochs of more moderate temperature. These are enumerated below.

Sixth glacial epoch, '*Upper Turbarian*," indicated by the deposits of peat which underlie the lower raised beaches.

Fifth interglacial epoch, "*Upper Forestian*."

Fifth glacial epoch, "*Lower Turbarian*," indicated by peat deposits overlying the lower forest bed, by the raised beaches and carse-clays of Scotland, and in part by the Littorina-clays of Scandinavia.

Fourth interglacial epoch, "*Lower Forestian*."

Fourth glacial epoch, "*Mecklenburgian*," represented by the moraines of the last great Baltic glacier, which reached their southern limit in Mecklenburg, the 100 feet terrace of Scotland, and the Yoldia-beds of Scandinavia.

Third interglacial epoch, "*Neudeckian*," intercalations of marine and fresh water deposits, in the boulder clays of the southern Baltic coasts.

Third glacial epoch, "*Polandian*," glacial and fluvio-glacial formations of the minor Scandinavian ice-sheet, and the "upper boulder clay" of northern and western Europe.

Second interglacial epoch, "*Helvetian*," interglacial beds in Britain, and lignites of Switzerland.

Second glacial epoch, "*Saxonian*", deposits of the period of maximum glaciation, when the northern ice-sheet reached the low ground of Saxony, and the Alpine glaciers formed the outer-zone moraines.

First interglacial epoch, "*Norfolkian*," the forest-bed series of Norfolk.

First glacial epoch, "*Scanian*," represented only in the south of Sweden, which was overridden by a large Baltic glacier. The Chillesford clay, and Weybourn crag of Norfolk, and the oldest moraines and fluvio-glacial gravels of the Arctic lands, may belong to this epoch.

LIST OF PLATES.

PLATE 1.

QUARTZITE PALÆOLITHS.

No. 2204-7. Large axe, guillotine type, Attrampakkam, Chingleput district.

„ 2204-8. Axe, Madras type, Attrampakkam, Chingleput district.

„ 3248. Do. do. old alluvium of the Sabarmati, Sadolia, Baroda.

„ 2204-5. Spear head type from North Arcot district.

„ 2204-9. Narrow pointed oval type, sharp edges all round, Attrampakkam nullah, Chingleput district.

„ 2204-22. Pointed sharp-sided "pebble butt" type, Kandukur, Nellore district.

„ 2204-10. Broad pointed oval type, Attrampakkam nullah.

„ 205. Oval type, edges rather sharp all round, Talya, Holalkere taluq, Mysore.

„ 2204-21. Do. very sharp edges all round, Kandukur, Nellore district.

PLATE 2.

PALÆOLITHS.

No. 305. Blunt-butt type, hæmatite quartzite, on hill north of Kurikuppa, Bellary.

„ 2898-A. Long pointed oval, quartzite, Malprabbha alluvium, Kaira, Bijapur district.

„ 309. Blunt-butt type, hæmatite quartzite, Joga shingle fan, Bellary.

„ 4078. Oval type, porcellanite, Rewah.

„ 2894. Broad pointed oval type, siliceous limestone, Yeddihalli, Surapur taluq, Hyderabad.

„ 294. Madras axe type, hæmatite quartzite, Halakundi fan, Bellary.

„ 308. Narrow oval type, quartzite, Kurikuppa hill, Bellary.

„ 2203-D. Double-pointed oval type, quartzite, Makrawalpalli, Cuddapah district.

„ 3309. Pointed oval, coarse quartzite grit, Pedhamli, Baroda. Gujarat.

PLATE 2—*cont.*

No. 88. Pointed oval chert? Ninniyur, Udayarpalaiyam taluq, Trichinopoly.

,, 4104. Do. pale quartzite, Rewah.

PLATE 3.

NEOLITHS.

No. 910. Celt, diorite, small, polished, shapely, Gadiganuru, Bellary.

,, 97. Do. gneiss, weathered, square sided, unpolished, Shevaroy hills.

,, 90. Do. hornblendic gneiss, round sided, polished, Shevaroy hills.

,, 99. Do. diorite, round-sided, incipient drill holes on both sides, Shevaroy hills.

,, 1005. Do. small, flattish, archæan schist, Gadiganuru, Bellary.

,, 2634. Do. shapely, perfect edge, basalt, Kotegallu, Hyderabad.

,, 159. Axe-hammer, hornblendic gneiss, Shevaroy hills.

,, 113. Celt, diorite, Shevaroy hills.

,, 106. Do. do. thin flattish, sides bevelled, Shevaroy hills.

,, 917. Do. flattish; archæan schist, Gadiganuru, Bellary.

,, 155. Do. do. with rounded sides, square shoulders, Shevaroy hills.

,, 120. Do. diorite, blunt butt, thick, Shevaroy hills.

,, 912. Do. do. dark green, rounded thick body, blunt butt, Gadiganuru, Bellary.

,, 115. Do. do. small, square shoulders, Shevaroy hills.

,, 89. Do. rounded sides, thick, pale granulite; Kanyakod hill, Malabar.

PLATE 4.

No. 992. Polished axe of black archæan schist, prototype of the early iron axe, Gadiganuru, Hospet taluq, Bellary district.

PLATE 5.

No. 992. Right side view of polished axe of black archæan schist, prototype of the early iron axe, Gadiganuru, Hospet taluq, Bellary district.

PLATE 6.

No. 1051. Chisel, hornblendic schist, Gadiganuru, Bellary district.

,, 402. Do. square body, rounded angles, perfect edge, unweathered, porphyritic black trap, Fort hill, Bellary.

,, 1993. Do. cross cut edge, thick body, diorite, Velpumadugu hill, Anantapur district.

,, 409. Do. with thick butt, dolerite, Fort hill, Bellary.

,, 412. Do. in second stage, basalt? Fort hill, Bellary.

,, 1047. Do. finished, hornblendic schist, Gadiganuru, Bellary district.

,, 1045. Do. do. do. do.

,, 403. Do. narrow-edged, thick body, third stage, basalt? Fort hill, Bellary.

,, 689. Do. thick body, unused, basalt, Kupgal, Bellary district.

,, 2149. Do. small, shapely, square sides, basalt, south of Kalamedevur hill, Anantapur district.

,, 1044. Do. elliptical edge, black trappoid, butt end wanting, Gadiganuru, Bellary district.

,, 2662. Scraper, thin long type, basalt, first stage, Wuttugallu site, Hyderabad.

,, 987. Pick or hoe, basalt, butt thick, edge thin, one face hollow, Gadiganuru, Bellary district.

,, 1122-*a*. Whetstone for celts, a Dharwar grit pebble, Gadiganuru, Bellary district.

,, 2655. Adze, "Polynesian type," fourth stage, broken, diorite, Wuttugallu site, Hyderabad.

,, 2373. Chisel flake of chert, Patpad eastern site, Banganapalle.

,, 2374. Javelin head of chert, Patpad eastern site, Banganapalle.

,, 429. Scraper, flake, oblong oval, basalt, Fort hill, Bellary.

PLATE 7.

No. 2788. A large deep granite mealing-trough dug out of made ground at the south-east foot of Rawalkonda, Sindunur taluq, Raichur Doab, Hyderabad State.

PLATE 8.

No. 1828-1. Shallow mealing-trough of granite found perched up as a table in a rock shelter facing west, near the top of Budihal, Gooty taluq, Anantapur district.

PLATE 9.

No. 1258-19. Biserrated flake, chert, Kurikuppa, Bellary district.
,, **4047.** Do. do. flint, Rohri, Sind.
,, **371.** Do. do. chocolate chert, North hill, Bellary.
,, **1258**-33. Do. do. dark chocolate chert, Kurikuppa, Bellary district.
,, **1258**-39. Do. do. dark chocolate chert, *ibid.*
,, **1187.** Do. do. do. Gadiganuru, Bellary.
,, **2663.** Do. do. browny pink, chert, Wuttugallu, Raichur Doab, Hyderabad.
,, **1463.** Do. do. chocolate chert, Mylapuram, Bellary district.
,, **2070**-A. Do. do. chert, pale chocolate, Penner Railway bridge, Anantapur district.
,, **1515**-24. Flake, curved, sharp-edged, mottled brown chert, Lingadahalli Cinder Camp, Bellary district.
,, **1437**-7. Do. sharp-edged, chocolate chert, Bellagoduhal, Bellary district.
,, **1457**-16. Biserrate flake, pale banded chocolate chert, west of Mugati, Bellary district.
,, **1515**-50. Flake, serrated, chocolate chert, Lingadahalli Cinder Camp, Bellary district.
,, **1437**-2. Do. sharp-edged, chocolate chert, Bellagoduhal, Bellary district.
,, **2083**-8. Do. knife, brown chert, entire, Havaligi hill, Anantapur district.
,, **2083**-7. Do. do. red brown chert, entire, Havaligi hill, Anantapur district.
,, **1352**-32. Flake saw, brown ochre chert, biserrate, Halekoté hill, Bellary district.
,, **2724.** Do. "lancet," raw sienna chert, Anandagal, Raichur Doab, Hyderabad.

PLATE 9—*cont.*

No. 1515-27. Broad leaf "microlith" pointed flake, dark brown-red chert, Lingadahalli Cinder Camp, Bellary.

" 2936. Flake, "microlith" lancet point, minute, red agate, Bahadurpur. Baroda.

PLATE 10.

Pygmy-flakes, flakes and cores.

No. 2981. Core of chalcedony, Bahadurpur, Baroda.

" 3622. Oval worked flake of white agate, site above Babapur, Amreli Prant, Kathiawar.

" 2980. Core of chalcedony, Bahadurpur, Baroda.

" 1258-31. Flake, serrated, of chalcedony, Kurikuppa, Bellary district.

" 2947. Lancet flake of agate, Bahadurpur, Baroda.

" 3035-*a*. Worked flake of chalcedony, Sigām, Baroda.

" 1258-10. Flake of chalcedony, Kurikuppa, Bellary district.

" 3400. "Lancet" flake of chalcedony, Amroli, Baroda.

" 2911. Flake of white agate, Bahadurpur, Baroda.

" 2966. Do. of chalcedony, *ibid.*

" 3041. Oval worked flake, scraper ?, chalcedony, Sigām, Baroda.

" 1852-14. Flake, scraper ended, agate, Vidapanakallu, Anantapur district.

" 2358. Do. biserrated, chalcedony, Mulagundamu hill, Kurnool district.

" 2974. Pygmy flake of chalcedony, Bahadurpur, Baroda.

" 2952. Flake, narrow, of do. *ibid.*

" 2970. Pointed pygmy flake, do. *ibid.*

" 2972. Pygmy flake knife of chalcedony, *ibid.*

" 2977. Do. do. do. *ibid.*

" 2973. Do. do. do. *ibid.*

" 2639-28. Do. scraper of chalcedony, Kotegallu, Hyderabad.

PLATE 11.

Pygmy flakes and worked flakes.

No. 1442-52. Pygmy flake knife, chert, mottled pinky white ; Nagaladinne, Adoni, Bellary.

" 1515-10. Do. do. with serrated edge, chert, Lingadahalli Cinder Camp, Bellary.

PLATE 11—*cont.*

No. **2976.** Pygmy flake knife, pointed, chert, dark red brown, Bahadurpur, Baroda.

" **1258**-16. Flake, pointed, chert, raw sienna, Kurikuppa, Bellary district.

" **2792.** Pygmy flake, saw, entire, chert, brown, Rawalkonda, Hyderabad.

" **2975.** Do. do. saw small, chert, dark-red brown, Bahadurpur, Baroda.

" **1442**-49. Do. flake knife, chert, dark-red brown; Nagaladinne, Adoni, Bellary.

" **1457**-8. Do. do. do. reddish chocolate, Mugati, Adoni, Bellary.

" **1442**-53. Flake knife, agate, browny bluish, Nagaladinne, Adoni, Bellary.

" **1457**-7. Pygmy flake knife, agate, brown, Mugati, Adoni T., Bellary.

" **2795.** Arrow head? chipped flake, mottled brown, agate; Rawalkonda, Hyderabad.

" **1515**-9. Pygmy flake knife, chert, dark drab, Lingadahalli Cinder Camp, Bellary district.

" **2790.** Worked flake, chert, pale chocolate, Rawalkonda.

" **3204.** Pygmy flake with file edge, light red chert, Mulsan hill, Baroda.

" **1457**-6. Do. do. knife, chert, dark chocolate, Mugati.

" **1442**-21. Flake knife of agate with brown crust, Nagaladinne, Bellary district.

" **1515**-32. Pygmy flake knife, entire, agate, Lingadahalli Cinder Camp, Bellary.

" **1457**-3. Do. do. carnelian, pale, Mugati, Adoni, Bellary.

" **1457**-23. Do. do. do. dark, Mugati, Adoni, Bellary.

" **3131.** Flake, agate, mossy light brown, Barria, Baroda.

" **2971.** Pygmy flake, chalcedony, grey, Bahadurpur, Baroda.

" **1366**-62. Flake arrow head? agate, Ramdurg, Bellary district.

" **1457**-2. Pygmy flake, sharp-pointed, carnelian, pale, Mugati, Adoni, Bellary.

" **3130.** Flake with file edges, agate, deep red, Barria, Baroda.

PLATE 12.

No. **1352**-52. Core, chocolate, chert, Halekoté hill, Bellary.

" **1440**-23. Do. speckly pinky grey, chert, Kotekallu hill, Adoni, Bellary.

PLATE 12—*cont.*

No. **1437**-1. Flake, chert, mottled, brown, Bellagoduhal, Bellary.
" **2574.** Core, chert, purplish grey, East site, Pātpād, Banganapalle.
" **2492.** Do. chalcedony with heliotrope crust, East site, Pātpād, Banganapalle State.
" **827**-80. Do. chert, dull light brown, Kupgal, Bellary
" **1352**-43. Do. agate, brownish, Halekoté hill, Bellary.
" **3068.** Triangular piercer, blue grey chalcedony, in the bed of the Tapti, Tajpur, Songad taluq, Baroda.
" **827**-60. Core, chert, brown banded, Kupgal, Bellary.
" **50.** Do. chert, red brown, from under the Teri, Sawyerpuram, Tinnevelly.
" **2436.** Strike-a-light, chert, double convex, radiating flakes, Pātpād, East site.
" **2213.** Do. do. scraper-shaped, black brown, Toranikal hill, Kurnool.
" **1457**-26. Do. nearly oval, chocolate, chert, Mugati, Adoni, Bellary.
" **4055.** Burin or graving tool, chert, Jabalpur.
" **3236**-*a*. Core, triple, of shaded orange agate, strong sand blast polish, Wasai hill, Baroda.
" **2376.** Worked flake, chert, buff, halbert-head shaped, East site, Pātpād.

PLATE 13.

No. **2399.** Scraper, thick, rather hollow faced, chert, reddish brown, Pātpād.
" **2626.** Do. chert, light yellowish brown, Bellumur Rayan Gudda, Lingsugur taluq, Hyderabad.
" **1821.** Do. do. greenish grey, Budibal, Anantapur district.
" **3446.** Do. do. red, Ámbaldi Hill, Damnagar taluq, Baroda, Kathiawar.
" **2111.** Do. do. chocolate, Muchukota, Tadpatri, Anantapur district.
" **1442**-46. Do. chert, mottled white, east of Nagaladinne, Adoni, Bellary.
" **1442**-32. Do. flake, agate, pale, mottled, east of Nagaladinne, Adoni, Bellary.
" **1258**-32. Do. do. chalcedony, pale, Kurikuppa, Bellary.

PLATE 13—*cont.*

No. 1442-50. Scraper, flake, agate, brown-banded, east of Nagaladinne, Bellary.
,, 2605-6. Scraper, slightly incurved, chert, red, Pātpād.
,, 3636. Incurved scraper, chert, mottled grey, Umria, Baroda, Kathiawar.
,, 1352-10. Pygmy flake, piercer, chert, pale chocolate, Halekote hill, Bellary.
,, 1361. Triangular piercer, hæmatite jasper, red and purple banded, Nagaradoni Fort hill, Alur, Bellary.
,, 3570. Do. do. chert, brown red, Babapur, Amreli, Kathiawar.
,, 1457-1. Pygmy flake, triangular, agate, milky white, Mugati, Adoni, Bellary.

PLATE 14.

No. 1515-43. Pointed flake, arrow-head ? chert, raw sienna, Lingadahalli Cinder Camp, Bellary.
,, 3559. Do. oval flake, arrow-head ? thin, chert, red-orange, Babapur, Amreli, Kathiawar.
,, 1457-20. Do. flake, arrow-head ? agate, Mugati, Adoni taluq, Bellary.
,, 43. "Tranchet," arrow-head, chert, Sawyerpuram, Tinnevelly district.
,, 3892. Tang of arrow-head ? chert, brown-grey, between Umria and Bhard, Amreli, Kathiawar.
,, 2386. Worked flake, one side flat, Lydian stone, black, Pātpād Cache, Banganapalle State.
,, 2408. Do. scraper ? chert, chocolate, Pātpād Cache, Banganapalle.
,, 3041. Oval worked flake, scraper ? chalcedony, dirty brown, Sigām, Sankheda taluq, Baroda.
,, 827-41. Pointed oval flake, arrow-head ? agate, Kupgal, Bellary district.
,, 1457-4. Pygmy flake knife, chert, red chocolate, Mugati, Adoni, Bellary district.
,, 827-42. Oval flake, scraper ? agate, Kupgal, Bellary district.
,, 3259. Oval flake, leaf-shaped, chert, red, Kot, Baroda.

PLATE 14—*cont.*

No. 2083-51. Pygmy flake, small, graving tool? chert, pinky and creamy, Havaligi hill, Anantapur district.

„ 1457-17. Do. small, graving tool? chert, red-brown Mugati, Adoni, Bellary.

„ 3254. Broad, oval, worked flake, chert? red brown, Lakrora, Baroda.

„ 827-39. Pygmy flake "gouge"? chert, chocolate, Kupgal, Bellary district.

PLATE 15.

Carvings in stone.

No. 1212. Spindle whorl, or button? purplish slate, Gadiganuru, Bellary.

„ 1548. Linga of steatite, Hurilihalu, Kudligi taluq, Bellary.

„ 1549. Do. do. do.

„ 3237. Disc, quartzite, thick, red brown, Mahuri, Baroda.

„ 2606-1. Incurved scraper of chert, Paspalla, Banganapalle.

„ 886. Scraper of jasper, pale chocolate, Kurikuppa hill, Hospet taluq, Bellary.

„ 80. Flake saw, chert, brown, in river gravel, Tirupatur, Sivaganga, Madura district.

PLATE 16.

No. 4043. Die of shelly limestone, dirty white, Tobermota, south-east of Dwarka, Kathiawar.

„ 1521. Bull amulet of reddish schist, on Narasimadeverugudda, Harpanahalli taluq, Bellary.

„ 3049. Bull's head of hard green chlorite schist, Vyara, Waghoria taluq, Baroda.

„ 1541. Human figure in long robe, purple slate, Anguru, Bellary.

„ 1457. Neck and lip of small bottle of grey steatite? hill fort, south-east of Yemmiganuru, Bellary district.

„ 2056. Plaque of carved drab sandstone, east of Tadpatri temple, Anantapur district.

PLATE 17.

BEADS OF DIFFERENT STONES.

No. 50. Crescent pendant of whitish chert, Alisandi hill, Raichur Doab, Hyderabad State.

„ 81. Steatite bead, brownish grey, Havaligi hill, Anantapur district.

„ 14. Small onyx bead, black and white, four-sided, Kalamadevur, Anantapur district.

„ 13. Onyx pendant, "Sulimani bead," Jabalpur.

„ 10. Lapis lazuli bead, small, rich blue, Maski, Raichur Doab, Hyderabad State.

„ 12. Do. do. Maski.

„ 15. Carbuncle, purplish crimson, Kanchikeri site, Bellary district.

„ 65. Sapphire.

„ 61. Dark amethyst.

„ 17. Rock crystal, double six-sided pyramid.

„ 6. Discoid bevel-edged bead, of green quartzite, Halekoté hill, Bellary district.

„ 49. Very short cylindrical bead of green quartzite.

„ 5. Square curved sided bead of green quartzite, Halekoté hill, Bellary.

„ 166. Pale red bead of coral ?? Alsur tank site, Mysore.

„ 66. Carbuncle bead, round, very dark red.

„ 4. Very short cylindrical bead of carnelian.

„ 44. Red sardonyx (carnelian).

„ 41. Do. (do.), square tabular.

„ 43. Red agate, lozenge-shaped.

„ 2. Red carnelian, discoid with grooved rays filled with white.

„ 21. Red agate, round, Kamrej island, Baroda.

„ 45. Red and pinkish agate, barrel-shaped.

„ 80. Grey agate, nearly oval, Pātpād, Banganapalle.

„ 60. Amethyst, clouded, flattish with grooved ends.

„ 1. Red carnelian, lenticular with short grooved rays filled with white, Kupgal, Bellary.

PLATE 18.

No. 3493-81. Side of vase, fragment of very fine light red pottery of Greek facies, half polished, Khijria Tappa, Amreli Prant, Kathiawar.

PLATE 18—*cont.*

No. 3493-77. Low lid of reddish pottery with steam hole, seen from above, *ibid.*

„ 3493-87. Fragment of strongly ribbed rough pottery, side of a chatty ? Isabel colour, *ibid.*

„ 2044. Celt with straight edge, basalt, Guntakal junction, Anantapur district.

„ 1853. Palæolith of oblong shape, of quartzite, Vidapunakallu, *ibid.*

„ 1948. Celt with very pointed butt and deep cutting edge, basalt, Velpumadugu, *ibid.*

„ 1939. Celt, an edged chip, basalt ? Velpumadugu, *ibid.*

„ 1734 Flake with ground edge, basalt, Budihal hill, *ibid.*

„ 3576. Oval implement, unfinished, chert, Babapur, Kathiawar.

„ 3413. Do. chert, brown, Damnagar, Amreli, Kathiawar.

„ 1726. Worked flake, granite, Uravakonda, Anantapur district.

PLATE 19.

No. 4107. Armlet of copper, Baragunda Cache, near Giridih, Bengal.

„ 259. Carved steatite object of uncertain use, Holakal hill, Mysore.

„ 3396. Large "thumbstone" (flaker), Kanja, Vyara taluq, Baroda.

„ 254. Net sinker of pale steatite, Komaranahalli, Mysore.

„ 3395. Half a ringstone, or mace-head, basalt, Serula, Songad taluq, Baroda.

„ 3044. Sandstone bowl of "Ganja" pipe ? Sigam, Sankheda taluq, Baroda.

„ 358. Pointed chisel, basalt, North Hill, Bellary.

„ 173. Small iron axe out of a grave, Moganād, Shevaroy hills, Salem district.

„ 4106. Large copper axe, Baragunda "Cache," near Giridih.

„ 174. Medium iron axe, Karadiyur, Shevaroy hills.

„ 178. Javelin head of iron, Karadiyur, Shevaroy hills.

PLATE 20.

No. 4041-17. Foot of small vase, of Greek facies, Dhalkania, Amreli, Kathiawar. Very fine pale red pottery.

PLATE 20—*cont.*

No. 3911-23. Lip of bowl, pale grey pottery, Kankawao, Jetpur, Kathiawar.

,, 4041-1. Do. pale red, with raised fillet of broad gashes, Dhalkania, Amreli, Kathiawar.

,, 551. Small adze (neolithic), second stage, basalt, Kupgal, Bellary district.

,, 2171. Cube of rich red and black banded jasper, a selected stone from a heap of stones on a Kurumbar grave, Tadpatri, Anantapur district.

,, 602. Hammer axe, short type, basalt, Kupgal, Bellary district.

,, 1530-30. Lip of painted bowl, diagonal trellis, south of 95th mile-stone, Bellary-Harihar high road.

,, 1530-3. Lip of painted bowl, two painted fillets, do. do.

,, 2318. Large core of chert (purple), west of Rangapuram, Kurnool district.

,, 550. Adze of basalt, second stage, Kupgal, Bellary district.

,, 2251. Hone of diorite, Bastipad, Kurnool district.

PLATE 21.

No. 192-K. Female figurine of earthenware, votive offering. Scotforth Estate, Shevaroy hills, found broken and very brittle.

,, 192-L. Do. do. do. do.

Both figurines wear short curls all round their heads and high combs on the top. They have no legs but were perched on cylindrical stands shown in Plate 23.

PLATE 22.

No. 192-K. }
,, 192-L. } Female figurines, Scotforth Estate, Shevaroy hills.

BACK VIEW.

PLATE 23.

No. 192-k. }
,, 192-h. } Female figurines, stands for.

,, 234-128. Pottery neck-rest, Narsipur Sangam, Mysore State.

PLATE 24.

No. 264-*h*-4. Polished red vase with oval base from a Kurumbar grave at Talya, Holalkere taluq, Mysore.

PLATE 25.

No. 264-*h*-5. Vase with flat base, red, half polished, from a grave in a Kurumbar ring at Talya, Holalkere taluq, Mysore.

,, **264**-*h*-3. Black and red polished lotah-shaped funereal urn with burnt human bones and one incisor tooth, *ibid.*

PLATE 26.

No. 2605-22. Milk bowl with spout lip from the eastern site at Pátpâd, Banganapalle State, Kurnool district. Red polished, painted with narrow purplish lines below the outer edge of the lip near the spout which did not appear in the negative.

PLATE 27.

No. 1565-69. Neck and lip of large highly decorated vessel, red.

,, **1565**-70. Do. do. do. vessel with medallion.

Both from Malyam, Rayadrug taluq, Bellary district.

PLATE 28.

No. 1565-69. Lip and neck of vessel seen from above (*vide* plate 27) from Malyam, Rayadrug taluq, Bellary district.

PLATE 28-a.

No. 1565-80. Side of chatty with leaf pattern from Malyam, Rayadrug taluk, Bellary district.

(The white spot on the right hand leaf is not part of the pattern but is due to a small flaw in the negative.)

PLATE 29.

No. **1565**-129. Bowl with steep flange at base of side and four grooves below lip outside, black rough ware.

,, **1565**-4-*a*. Do. two-fifths of whole, with three condiment cells on lip, black rough ware.

,, **1565**-77. Do. lip and side of, small, lip left barred on outer edge, faint right-barred fillet lower down over two impressed leaves. Colour dull red.

,, **1565**-78. Melon-bowl with sloping lip, with one groove, fillet of faint vandykes below corded edge. Colour light red, slightly incrusted.

,, **1565**-73. Do. lip and neck, light red, half-polished, narrow flat-topped lip with left-barred fillet to outer edge of lip. Four small grooves on neck.

All from Malyam, Rayadrug taluk, Bellary district.

PLATE 30.

No. **2055**-1. Side of small "adipu" or portable hearth, painted red, with raised fillet of finger tip impressions low down on outer side; east of Tadpatri temple, Anantapur district.

,, **234**-113. Shallow bowl, red and black, high polish outside, black inside, Narsipur Sangam, Mysore.

,, **234**-125. Ringed cup, or lotah; a sacrificial vessel? red, *ibid.*

,, **234**-90. Lotah, small, steep-sided, wide mouth, *ibid.*

,, **252**-87. Flanged bowl, red, West Hill, French Rocks, Mysore.

,, **234**-109. Lotah, black, polished, Narsipur Sangam, Mysore.

,, **234**-36. Side of bowl, wrinkle pattern, black and brown, polished, Narsipur Sangam.

,, **234**-115. "Finger bowl," black and red, polished, *ibid.*

,, **234**-80. Side of vessel with "reeded" fillet on bulge, *ibid.*

PLATE 31.

No. **2783**-104. Side of vessel with deeply impressed fillet of large vandykes, Maski, Raichur Doab, Hyderabad.

PLATE 31—*cont.*

No. **2203**-1. Chatty, small, side of, with two fillets of impressed vertical barlets, Yellatur, Cuddapah district.

„ **2055**-26. Side of vessel with three fillets, east of Tadpatri, Anantapur district.

„ **3493**-98. Base of vase of pale red ware with greek facies, Khijria Tappa, Damnagar taluq, Baroda, Kathiawar.

„ **2203**-13. Part of lotah filled with toddy-makers' chunam, Yellatur, Cuddapah district.

„ **3911**-32. Disc of light brown ware with shallow central depressions on both sides, old site, Kankawao, Jetpur State, Kathiawar.

PLATE 32.

No. **2258**-55. Lip of bowl, with fillet of pitlets on top, Bastipad, Kurnool district.

„ **1530**-46. Do. and neck of vase, red brown painted and polished, 95th mile site, Bellary-Harihar road.

„ **2203**-Z-1. Lip of broad bowl, with waved lower rim, Mundlavaripalli, Cuddapah district.

„ **1515**-90. Do. do. with three horizontal grooves, coarse silvery grey ware, Lingadahalli Cinder Camp, Bellary district.

„ **234**-44. Do. melon bowl, with three big grooves on top and fillet of finger tip impressions on shoulder, Narsipur Sangam, Mysore.

„ **1520**-A. Lip of broad bowl, with opposite sloping gashes, Niluvanji, Harpanahalli taluq, Bellary.

„ **837**-F. Do. bowl with waved claw fillet at lower edge. Kupgal, Bellary.

„ **252**-37. Do. steep-sided bowl with raised fillet of X crosses, West Hill, French Rocks, Mysore.

„ **3165**-*a*. Do. steep-sided bowl, with fillet of pitlets vertically arranged, Barria, Baroda State.

PLATE 33.

No. **2668**-5. Lip of large bowl with finger-tip marks on rim, Wuttugallu, Raichur Doab, Hyderabad.

„ **2639**-49. Do. do. with raised twitched fillet on tops Kotegallu, Lingsugur, Hyderabad.

„ **3911**-21. Thick lip of large bowl of coarse bath-brick ware, painted red-brown externally, Kankawao, Jetpur State, Kathiawar.

„ **1565**-81-A. Lip and neck of small chatty, bright, red polished; faint left barred fillet, Malyam, Bellary district.

„ **2886**-39 *a*. Bowl with ex-curved lip, brown red polished, with low rounded fillet above angular bulge, old site in Hyderabad State on left bank of Tungabhadra.

PLATE 34.

No. **2872**-2. Top of lip of melon bowl with three circles of pitlets, pale red, polished, earthenware, Rawalkonda.

„ **2203**-6. Do. do. red painted, two grooves and fillet of short vertical barlets on top, Yellatur, Cuddapah.

„ **2203** Z-5. Top of lip melon bowl with two grooves, divided by plain band, fillet of left sloping barlets below lip, Yellatur, Cuddapah district.

„ **2258**-77. Side of lip of bowl, fillet of upright cord marks, Bastipad, Kurnool district.

„ **1565**-40. Side spout, very low cone of rough red earthenware, Malyam, Bellary district.

„ **1345**-2. Tall neck of small bottle red rough earthenware, Sanavasapuram Cinder Camp, Bellary district.

„ **1438** *a*. Fragment of very small black vessel with two mouths, Sugura, Bellary district.

„ **1429**-70. Inner slope of lip of large bowl, Sanganakallu, Bellary district.

„ **1565**-75. Lip and neck of bowl with crutch-shaped lip, Malyam, Bellary district.

„ **263**-8. Bead, terracotta, part of "Cat's cradle" toy, Banvali, Chennapatna, Mysore.

PLATE 34—*cont.*

No. **234**-62. Lip and neck of bowl with upward claw fillet below lip, light red, Narsipur Sangam, Mysore.

" **201**-*a*. Part of bead ? a "Cat's cradle" toy, old site east of Srinivaspur, Mysore.

" **257**-*d*. Fragment of grey earthenware with deep festoon, Kaldurga hill, Tarikere taluq, Mysore.

PLATE 35.

No. **2070**-*a*. Side of vessel with roped fillet, east of Bogasamudram, Anantapur district.

" **2055**-4. Lip and neck of bowl with plain fillet on neck, site east of Tadpatri temple, Anantapur district.

" **2055**-30. Circular dish with an inner vertical flange, *ibid*.

" **2055**-33. Side of chatty with two fillets of bipinnate impressions, one left, one right sloping, *ibid*.

" **252**-45. Lip of small bowl, red polished, thin excurved lip, West Hill, French Rocks, Mysore.

" **2055**-31. Side of chatty with two fillets of herring bone pattern impressions, site east of Tadpatri temple, Anantapur district.

" **2605**-32. Half of thick lens of red polished earthenware of uncertain use, eastern site, Patpad, Banganapalle.

" **2605**-28. Side of large chatty, painted, black stripes on red. *ibid*.

" **252**-22. Lip and neck of red bowl, West Hill, French Rocks, Mysore.

PLATE 36.

No. **2258**-73. Fragment of side of bowl of grey colour festooned with fillet, Bastipad, Kurnool district.

" **2055**-15. Medallion on side of vessel, red, polished, east of Tadpatri temple, Anantapur.

" **257**-*c*. Lip and neck of vessel with zig-zag fillet above fillet of keyhole pattern, Kaldurga hill, Mysore.

" **1345**-4. Side of vessel with six vertical grooves, coarse, grey ware, Sanavasapuram Cinder camp, Bellary district.

PLATE 36—*cont.*

No. **252**-62. Side of vessel with two medallions, showing cross with four dots inside a circle, below a raised fillet, West Hill, French Rocks, Mysore. Probably a Swastika.

,, **202**-38. Do. with fillet of diagonal grating above fillet of double dot verticals, site east of Srinivaspur, Kolar, Mysore.

,, **1460**-A. Do. with painted diagonal grating, south end of Halwi hill, Bellary district.

,, **2055**-68. Side of bowl with painted diagonal grating, east of Tadpatri temple, Anantapur.

,, **260**-13. Do. with painted radiating ladders of horizontal stripes, Holakal hill, Mysore.

,, **1456**-10. Side of vessel with two dots and circle medallions between raised rounded fillets, colour red-brown, west of Tower Rock, Peté, Adoni taluk, Bellary.

,, **386**-7. Do. with painted shield of square grating, North Hill, Bellary.

,, **2203**-Z-53. Do. with three wavy fillets in grooves, Mandlavaripalli, Cuddapah district.

PLATE 37.

No. **837**-I. Lip and neck of bowl with down turned claw pattern, below lip, old site Bellagoduhal, Bellary district.

,, **1437**-28-*a*. Steep sided bowl with broad raised fillet on bulge; Bellagoduhal, Bellary.

,, **1565**-7. Side of circular dish with fillet of left sloping barlets, Malyam, Bellary district.

,, **1565**-151. Do. or flange handle of vessel seen from above, dark grey, Malyam, Bellary district.

,, **3409**-*a*. Do. of vessel with impressed pellet pattern, old site, Amroli Tappa, Baroda.

,, **444**-4. Side of vessel with tall zig-zag pattern, Fort Hill, Bellary.

,, **234**-52. Lip of melon bowl with leaf pattern on top of lip, light red, Narsipur Sangam, Mysore.

,, **849**-*c*. Side of vessel with hole for rope handle, Budikanama, Bellary district.

,, **834**. Figurine of animal, a votive offering, nose, one horn and legs broken off, Kupgal, Bellary district.

PLATE 37—*cont.*

No. **2606**-4. Disc of hæmatite jasper, rather rude. Paspalla, Banganapalle.

,, **2783**-86. Hut-urn (?) part of right jamb of door, Maski, Raichur Doab, Hyderabad.

,, **1552**-*a*. Belted hammer of granite, 1st stage, broken, Hosahalli, Kudligi taluq, Bellary.

,, **3428**. Belted hammer of gabbro, badly broken, but polished surface remains in the belt and on the face. The cross below the figure indicates the position of the belt which would not show unless placed vertically. Rupavati, Damnagur taluq, Amreli Prant, Baroda, Kathiawar.

PLATE 38.

No. **260**-3. Fragment of side of rose vessel ? Grey brown, Holakal hill, Mysore.

,, **3031**-*a*. Small saucer, a lamp? Grey, rough, earthenware, Wadeli, Baroda.

,, **386**-13. Tuyère, unused, grey and light red, North Hill, Bellary.

,, **1435**-3. Lip and neck of bottle, grey ware.

,, **3068**-*a*. Side of chatty, pale grey, Kujadpura Loess hill, Baroda.

,, **234**-105. Conical lid of vessel, Narsipur Sangam, Mysore.

,, **234**-106. Spout of vessel, red, half polished ware with impressions round, base, Narsipur Sangam, Mysore.

,, **3246**-1. Figurine of bull with two garlands round its neck, Mahuri, Baroda.

,, **234**-108. Neck of black bottle with leaves on flange, Narsipur Sangam, Mysore.

,, **444**-25. Curved spout of vessel, black and light brown, polished, Bellary Fort Hill.

,, **1353**-4. Flange handle of vessel, coarse black ware, South Hill, Halakoté, Bellary.

,, **1530**-*a*. Side of vessel with acute bulge showing impressed pattern, Kanchikeri, Bellary.

,, **1516**-*a*. Conical lid of vessel of earthenware, Sindavallam, Bellary.

,, **3308**-*a*. Lid of vessel, Phudera, Baroda.

,, **237**-29. Side of deep bowl with vertical nicks, Lakshampura ford, Mysore.

PLATE 38—*cont*.

No. **2605**-*r*. Lid of vessel, Patpād, Banganapalle.
„ **1213**-18. Tongue of idol, probably Kali, Gadiganuru, Bellary.

PLATE 39.

No. **252**-88. Small single wick lamp, red, entire (a small flaw in photograph makes it look broken) West Hill, French Rocks, Mysore.
„ **2203**-15-*a*. Shoulder and neck of chatty, pale red, polished, Yellatur, Cuddapah.
„ **2886**-2. Jar, red, half polished, old site on the left bank of Tungabhadra, Hyderabad State.
„ **1437**-26. Shoulder of vessel, black over red, with large fillet of vandykes, Bellagoduhal, Bellary.
„ **260**-11. Side of chatty, red, raised fillet of small finger-tips, Holakal hill, Mysore.
„ **234**-79. Do. with highly raised fillet of thumb impressions, Narsipur Sangam, Mysore.
„ **1520**-*b*. Lip of grey bowl with high fillet of finger nail prints, Niluvanji, Harpanahalli taluq, Bellary.
„ **3315**-*a*. Lip of large bowl of black earthenware from the bed of a brackish stream at Vasravi, Velacha taluq, Baroda.
„ **1530**-C. Do. basin, grey ware with twitched thumb-nail marks on top, old site close to Kanchikeri, Bellary.

PLATE 40.

BEADS.

No. **79**-*a* & *b*. Terra-cotta, Gudivada, Kistna district.
„ **184**. Large spherical light brown with three equatorial lineal grooves.
„ **107**. Black paste, north of Bellaguppa, Bellary district.
„ **140**. Turban, deep green glass.
„ **79**-*c*. Biconical, ringed terra-cotta, Gudivada, Kistna district.
„ **121**. Blue cylinder, Peté Tower rock, Bellary district.

PLATE 40—*cont.*

No. 111. Turban-shaped, north of Bellaguppa, Bellary district.
,, 110. Double crimson glass, *ibid.*
,, 172. Cylinder, glass, oval, opposite Hampasagara, Hyderabad.
,, 168. Turban, glass, Vallabipur.
,, 167. Cylinder, glass, Ghattu fort, Cuddapah district.
,, 106. Globural glass, north of Bellaguppa, Bellary district.
,, 182. Cylinder, green paste, Peté Tower rock site, Bellary district.
,, 186. Spindle-shaped, terra-cotta, one of a set, Anguru, Bellary.
,, 154. Polyhedral, rich blue, glass, Malyam.
,, 165. Turban, glass, Bellaguppa, Bellary.
,, 144. Turban, green, paste.
,, 133. Glass, blue imitation onyx.
,, 170. Cylinder, bright yellow.
,, 100. Polyhedral. paste, Anguru, Bellary.
,, 175. Globular, truncated ends, red, paste, Vallabhipur.
,, 113. Cylinder, red, paste, Malyam.
,, 127. Paste, Molanal hill, Mysore.
,, 141. Turban, paste, Vemala, Cuddapah district.
,, 130. Small cylindrical black paste, Malyam.
,, 91. Shell, Peté Tower rock, Bellary.
,, 88. Do. Bellary Fort Hill.
,, ? Chank shell bead, barrel-shaped.

PLATE 41.

SHELL USED AS ORNAMENT.

No. 3428-*c*. Bangle. Rupavati.
,, 3622-64. Section of a bangle, Ambavalli site.
,, 3310-1. Turbo shell, old site at Mahuri on the Sabarmati, Baroda.
,, 1518-9. Bangle, with dorsal ridge, east of Hampasagara, Bellary district.
,, 1518-6. Do. Hampasagara, Bellary district.
,, 1518-5. Do. do. do.
,, 1518-2. Paludina shell bead, Hampasagara, Bellary district.
,, 2783-1. Natica shell pendant, Maski, Hyderabad.
,, 3493-2. Nerita shell, bead made by grinding a hole in the back, Vallabipur, Kathiawar.
,, 1456-13. Cowrie bead, Tower Rock site, Peté, Bellary district.

PLATE 41—*cont.*

No. 3410-2. Trochus shell bead, made by grinding holes in its sides, Damnagar, Kathiawar.
,, 3310-8. Bent bangle, old site at Mahuri, Baroda.
,, 3493-6. Disc, with cushion, Vallabipur, Kathiawar.
,, 3493-9. Bangle, Vallabipur, Kathiawar.
,, 3310-5. Small carved finial, old site at Mahuri, Baroda.
,, 2783-3. Disc of shell, a currency token? Maski, Hyderabad.
,, 234-129. Left valve of large *Unio* made into a pendant with small perforation of umbo and large circular hole ground in the side, Narsipur Sangam, Mysore.

PLATE 42.

BANGLES OF CHANK SHELL.

No. 3493-45. Bangle for a child, broad, ruins of Vallabipur, Kathiawar.
,, 3493-44. Do. broad, very large, oblique, *ibid.*
,, 3493-43. Do. groove, *ibid.*
,, 3493-59. Do, narrow, *ibid.*
,, 3493-19. Do. with two dorsal grooves, *ibid.*
,, 3493-13. Do. narrow, with carved umbo in shape of a shell, *ibid.*
,, 3493-7. Do. elaborately carved, *ibid.*
,, 3493-8. Do. top half, *ibid.*
,, 3493-11. Do. fan-pattern, *ibid.*
,, 3493-10. Do. with diagonal bar pattern, *ibid.*
,, 3615-1. Do. medium, Babapur, Kathiawar.
,, 3623-2. Do. narrow, Kathiawar.
,, 3310-6. Do. rather broad, elaborately carved pattern, Mahuri, Gujarat.
,, 3310-7. Do. do. do. *ibid.*
,, 3066-*b*. Do. tall zig-zag pattern, Kamrej on the Tapti, Baroda State.
,, 1516-B. Do. large rounded ground groove, Sindavallam, Bellary.

PLATE 43.

BANGLES OF CHANK SHELL.

All from the old site at Ambavalli near Amreli, Kathiawar.

No. 3622-49. Bangle, thick, very oblique, tesselated.
,, 3622-53. Do. medium broad, carved.

PLATE 43—*cont.*

No. 3622-55. Bangle umbo elaborate.
,, 3622-56. Do. medium carved, umbo and cross grooves
,, 3622-51. Do. large thin, curved umbo.
,, 3622-54. Do. do. deep, curved back.
,, 3622-57. Do. figure of a shell.
,, 3622-45. Do. left-sloping groove along back.
,, 3622-35. Do. broad, with five shallow grooves.
,, 3622-43. Do. outer edges serrated.
,, 3622-42. Do. do. do.
,, 3622-46. Do. back with diagonal grating.
,, 3622-44. very oblique two narrow grooves.
,, 3622-50. Do. oblique, back, decorated.
,, 3622-47. Do. very narrow, back denticulated.
,, 3622-48. Do. narrow, back lobated.
,, 3622-9. Do. dorsal groove, baby's size.

PLATE 44.

GLASS BANGLES.

No. 47. Bangle, streaky, Bastipad, Kurnool.
,, 108. Do. with left sloping barlets on back.
,, 18. Do. slender, yellow glass, Kotekallu, Bellary.
,, 9. Do. do. green, Rawalkonda, Hyderabad.
,, 81. Do. deep green over light green paste, Malyam, Bellary.
,, 76. Do. yellow glass, Rayadrug.
,, 52. Do. light on citron, Tsannagundla Drug.
,, 16. Do. dorsal yellow band between light red corner bands, Murigudda.
,, 1. Do. with dorsal groove, Toranagallu, Bellary.
,, 24. Do. light red, on citron, Kotekallu Drug, Bellary.
,, 26. Do. do. with yellow stripe, Kotekallu Drug.
,, 53. Do. Tsannagundla Drug, Kurnool.
,, 74. Do. dorsal groove, south of Hurilihalu, Bellary.
,, 103. Do. dorsal groove, north of Bellaguppa, Bellary.
,, 70. Do. broad, hollow back, blue, Anguru.
,, 39. Do. do. broad hollow back, sap green, Tower Rock, Peté, Bellary.
,, 85. Do. coiled, yellow, Malyam mounds, Bellary.

PLATE 44—*cont.*

No. **127.** Bangle, light green glass, Quetta, Baluchistan.
,, **128.** Do. do. *ibid.*
,, **17.** Do. honey brown with yellow enamel spot, Kotekallu Drug, Bellary.

PLATE 45.

GLASS BANGLES.

No. **123.** Brown crested, Patpad, Banganapalle.
,, **70.** Thin, blue, Anguru, Bellary.
,, **99.** Orange dorsal line, with yellow crestings, north of Bellaguppa, Bellary.
,, **100.** Do. *ibid.*
,, **77.** Three oval shields on yellow body, Malyam, Bellary.
,, **101.** Light greenish blue, Bellaguppa, Bellary.
,, **73.** Black with yellow corner lines, Jerramalla, Bellary.
,, **27.** Do. do. Kotekallu, Bellary.
,, **72.** Pale glass, with orange corner lines and yellow medium line on back, South Foot, Jerramalla, Bellary.
,, **80.** Deep flesh colour, Malyam, Bellary.
,, **36.** Light blue, with yellow bands, Tower Rock, Peté, Bellary.
,, **78.** Green dorsal band on yellow body, Malyam, Bellary.
,, **44.** Twisted yellow and green ridge, Tower Rock, Peté, Bellary.
,, **79.** Pale blue band, Malyam, Bellary.
,, **3.** Green body with yellow edges, Maski, Hyderabad.
,, **2.** Do. do. *ibid.*
,, **8.** Citron green, with yellow, Rawalkonda, Hyderabad.
,, **5.** Honey yellow wilh chrome yellow, *ibid.*

PLATE 46.

No. **74.** Bone pendant from submerged forest at Valimukkam, Ramnad Zamindari, Madura district.
,, **193-*a*.** One of a pair of thorns of *Acacia latronum*, a possible arrow head, Mallapuram, Salem district.
,, **347.** Bone chisel, a polisher? Halakundi, Bellary.

PLATE 46—*cont.*

No. **262.** Bronze disc for lobe of ear, iron age, out of a grave at Banwali, Chennapatna, Mysore State.

,, **3315**-*e*. Disc of enamelled fayence, Vasravi, Velacha taluk, Baroda.

,, **260**-2. Perforated disc of dark brown stone, Holakal hill, Mysore.

,, **261**-*a*. Very small toy chatty, handmade, black, west of Somnathpur temple, Mysore.

,, **444**-8. Earthenware cone, a phallus? or a piece in some game, Fort Hill, Bellary.

PLATE 47.

No. **266.** Fragment of impressed pottery, the race-course, Bangalore.

,, **2739.** Fragment of carved bone rod, west of Maski, Hyderabad.

,, **265.** Fragment of pottery, with impressed pattern, the race-course, Bangalore.

(Figures rather enlarged.)

PLATE 48.

No. **3044**-*a*. Square hammer of Songir sandstone, Sigām, Baroda State.

,, **2034**-*a*. Mealing stone, pale granite, biconvex oval, Velpumadugu hill, Anantapur district.

,, **2899.** Square hammer, diorite, Gokak, Belgaum district.

,, **3067.** Round hammer of calc areous pudding stone, Galha, Kamrej taluk., Baroda State.

,, **2055**-88. Crateriform bowl, coarse, red, east of Tadpatri temple, Anantapur district.

,, **1446.** Mallet of diorite, south-west of Nagaladinne, Bellary district.

PLATE 49.

Iron implements found in buried vessels in the Patpād cache, Banganapalle State, Kurnool district.

No. **2605**-61. Arrow head of iron, two barbed.

,, **2605**-66. Nail trimmer.

,, **2605**-64. Arrow head, two barbed.

PLATE 49—*cont.*

No. **2605**-62. Leaf-shaped arrow head.
„ **2605**-65. Spud-head.
„ **2605**-63. Leaf-shaped arrow head.

PLATE 50.

From an iron age burying place at Kil Mondambadi near the top of the new ghat up the Shevaroy hills, Salem district. The implements came out of a burial place.

No. **192**-*e*. Javelin head, with tang.
„ **192**-*a*. Large iron axe.
„ **192**-*d*. Javelin head, with tang.

PLATE 51.

No. **176**. Spear-head from an old grave at Karadiur, Shevaroy hills, Salem district.
„ **192**-*c*. Short sword.
„ **192**-*b*. Billhook and handle, in one piece.
} From an iron age burying place at Kil Mondambadi near the top of the new ghat up the Shevaroy hills. The implements came out of a burial place.

PLATE 52.

No. **1401**. Large scraper of basalt, old site, Sanganakallu, near Bellary.
„ **658**. Circular do. Kupgal, near Bellary.
„ **649**. Scraper, typical shape, basalt, Kupgal, near Bellary.
„ **1402**. Celt, five joint planes old site, Sanganakallu, near Bellary.
„ **1122**. Half of a stone vessel of diorite, Gadiganuru, Bellary district.
„ **2367**. Pestle
„ **2368**. Mortar } both of diorite, found together in the Patpād cache, Banganapalle State.
„ **4054**. Large core, made of flint, probably from Rohri, Sind.
„ **426**. Goldsmith's anvil, syenite, Bellary Fort Hill.
„ **2258**-49. Middle part of pottery hearth, coarse red, old site, Bastipad, Kurnool district.
„ **4085**. Mace head, brown sandstone, Rewah State.
„ **2606**-12. Selected stone, a natural wedge of quartzite, Paspalla, Banganapalle State, Kurnool district.

PLATE 53.

No. 2886-6. Painted bowl, out of a grave in the Hyderabad territory on the left bank of the Tungabhadra, opposite to Hampasagara. It had been washed out of the grave, a low tumulus, by a heavy flood shortly before I found it.

PLATE 54.

No. 2886-1. Mouth and neck of bottle, pale red earthenware, old site in Hyderabad territory, opposite Hampasagara.

„ 257-*f*. Lip and neck of chatty vase, black and red, Mysore State.

„ 2734-1. Side or internal (?) handle of vessel, earthenware, fawn and grey, Anandagal, Hyderabad.

„ 1355-*a*. Bowl, coarse, brown drab, earthenwaie, Hospet hill, Alur taluq, Bellary.

„ 234-107. Neck of bottle of drab rough earthenware, Narsipur Sangam, Mysore.

PLATE 55.

No. 2605-*i*. Bowl-dish, of black and red, mottled, polished ware, resting on a ringstand.

„ 2605-*u*. A ringstand of red ware.

Both from the cache at Patpād, Banganapalle State, Kurnool district.

PLATE 56.

No. 2605-*d*. Vase, flower pot type, black and red, polished.

„ 2605-*e*. Vase with narrow lip.

Both from the cache at Patpād, Banganapalle State, Kurnool district.

PLATE 57.

No. 2335-*a*. Fragment of chatty brown in colour, with linear incised pattern, from the South Hill at Tsanugondla, Kurnool district.

Other parts of this chatty are figured in plate 58.

PLATE 58.

No. 2335-*a*. Neck and shoulder of chatty figured in plate 57 from Tsanugondla, Kurnool district.

PLATE 59.

No. 2783-100. Melon-shaped bowl, with fillet of raspberry ornament from the old site, west of Maski, Hyderabad State.

PLATE 60.

No. 2633-1. "Boukranion," bull's skull, grey earthenware, Bellamur Rayan Gudda, Hyderabad State.

" **2633**-2. Double stopper of dark blackish earthenware, a belted hammer in shape, Bellamur Rayan Gudda, Hyderabad State.

PLATE 61.

No. 463. Large celt in second stage, basalt, Kupgal (hill), Bellary district.

PLATE 62.

No. 1463-*a*. Neolithic celt-polishing groove worked into solid granite on the surface of a great rock east of Helalagundi, 24½ miles N.N.E. of Bellary, one of a series of 43 grooves.

PLATE 63.

No. 2895-*a*. Side of a vessel with short spout, of deep red polished earthenware, from an abandoned copper mine in the valley of the Kistna, Hyderabad State.

" **1213**-1. Handle of a vessel of grey earthenware from the old neolithic site at Gadiganuru, Bellary.

PLATE 64.

No. 2887-7. Elephant-shaped funereal vase from the left bank of the Tungabhadra, Hyderabad State.

Diagram section of right bank of the Sabarmati river, Gujarat, to face page 15.

Sketch of axe used for cutting laterite at Kottayam in Travancore, to face page 63.

Cut to explain possible shafting of palæolithic spear-head, Addendum No. IV.

Map in pocket.

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ERRATA IN PLATES.

Plate	8	*For* No.	1828	*read*	1828-1.
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,,	13	,,	1442	,,	1442_{32}
,,	14	,,	2336	,,	2386.
,,	,,	,,	2403	,,	2408.
,,	,,	,,	2083_{57}	,,	2083_{51}.
,,	16	,,	4045	,,	4043.
,,	30	,,	234_{88}	,,	234_{36}.
,,	32	,,	$2203_z(_2)$	,,	$2203^z(_1)$.
,,	34	,,	2203_{25}	,,	$2203_z(_5)$.
,,	,,	,,	201	,,	201*a*.
,,	36	,,	1456_J	,,	1456_{10}.
,,	38	,,	234_{104}	,,	234_{105}.
,,	,,	,,	444_{26}	,,	444_{25}.
,,	,,	,,	$1353_A(_4)$	,,	1353_4.
,,	,,	,,	1530_A	,,	1530_a.
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,,	,,	3rd row	second figure	,,	172.
,,	,,	5th row	third figure	,,	170.
,,	,,	,,	fourth figure	,,	100.
,,	,,	,,	fifth figure	,,	175.
,,	,,	6th row	first figure	,,	113.
,,	,,	,,	fifth figure	,,	130.
,,	,,	7th row	first figure	,,	91.
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,,	,,	3rd row *for*	2783_3	,,	2783_1.
,,	48	*For* No.	3044_A	,,	3044_a.
,,	,,	,,	2034_A	,,	2034_a.
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,,	,,	,,	2605_{128}	,,	2605_{66}.
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,,	55	,,	6205	,,	2605_i.
,,	,,	,,	6205_u	,,	2605_u.
,,	57	*For*	Tsanagundla	,,	Tsanugondla.

The following have been twice figured—

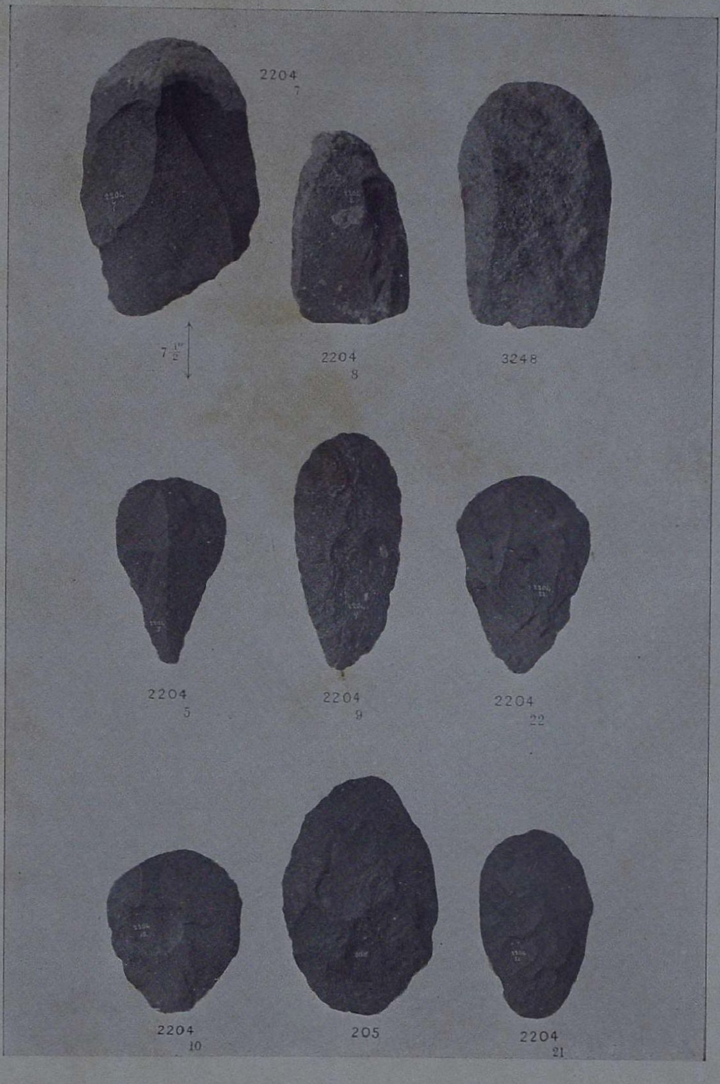
2070*a* figured in plates 35 and 38.

3308*a* ,, 38 and 54.

The following specimens have been figured but are not referred to in the catalogue :—

Plate 31 No. 2783_{104}.
,, 32 ,, 837_{F}.
,, 37 ,, 837_{1}.
,, 38 ,, 1435_{3}.
,, 40 second figure in the sixth row.
,, 41 No. 3246*a*.
,, 44 *x*.
,, 45 No. 1615.
,, ,, kj.

Plate I.



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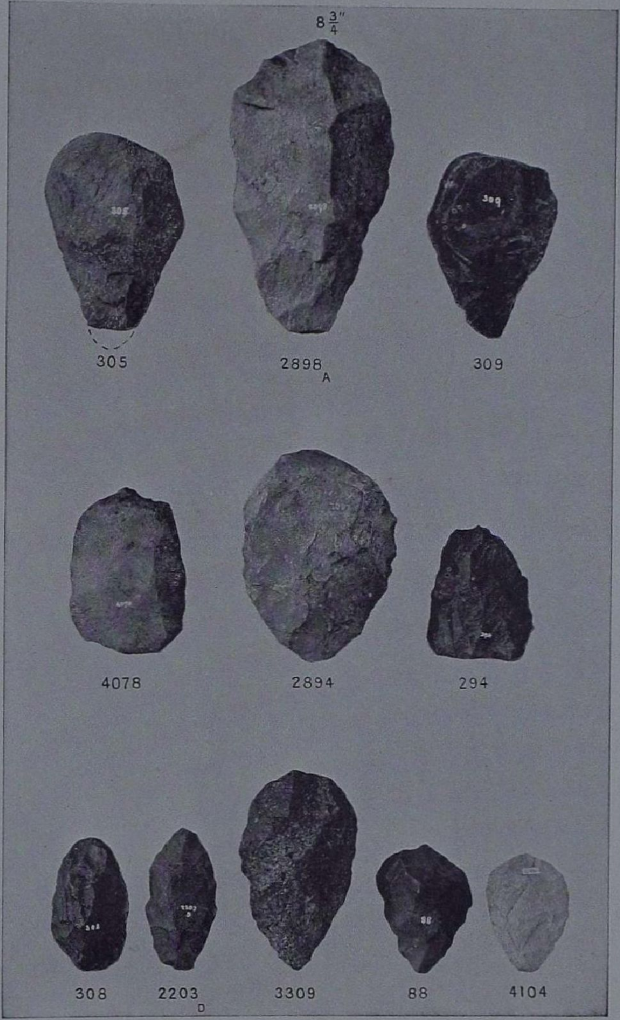
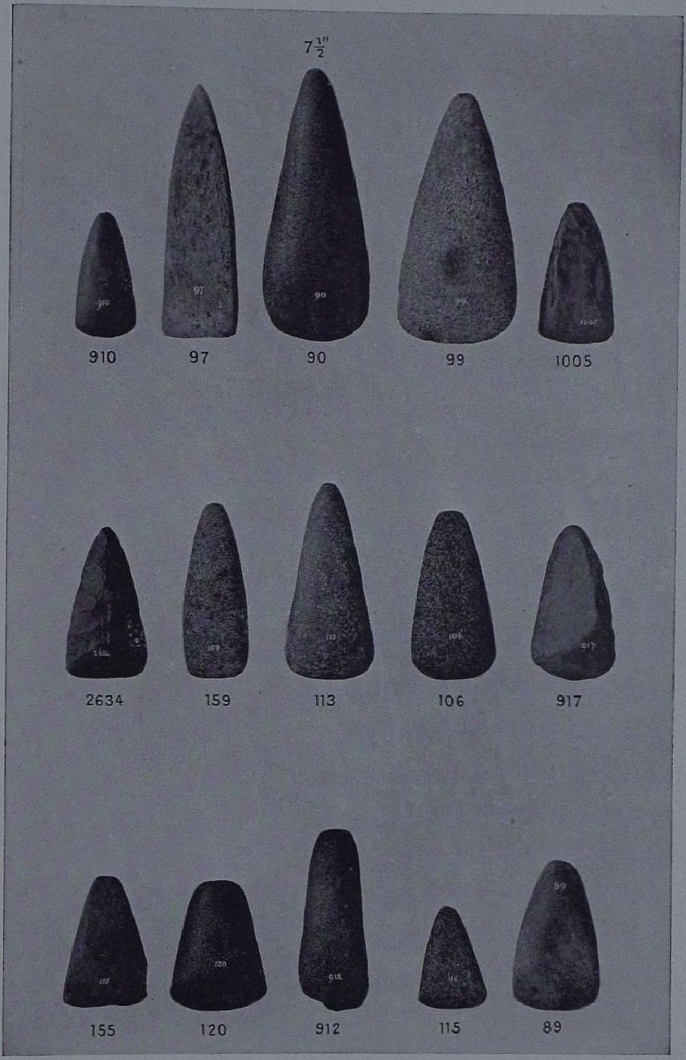


PALÆOLITHS.

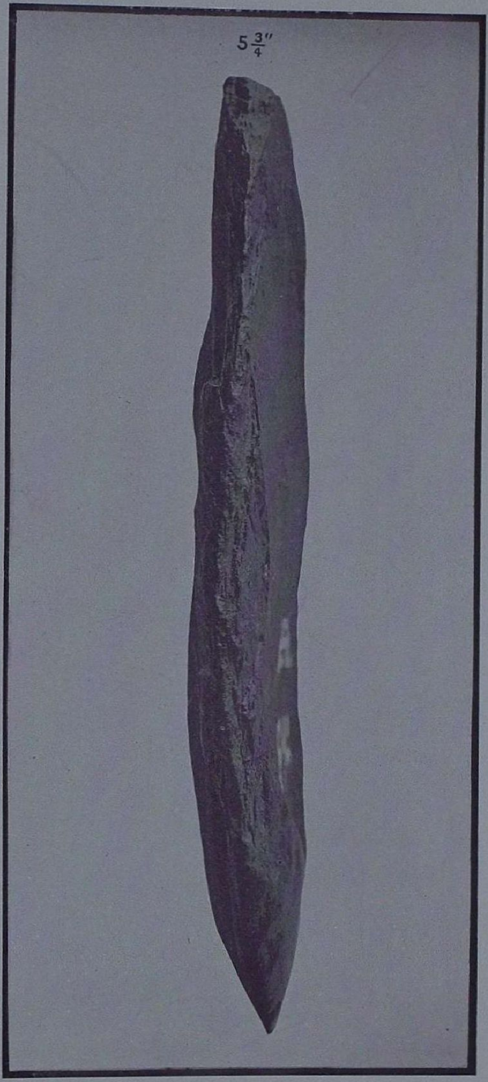
Plate 3.



NEOLITHS.

Plate 4.

Plate 5.



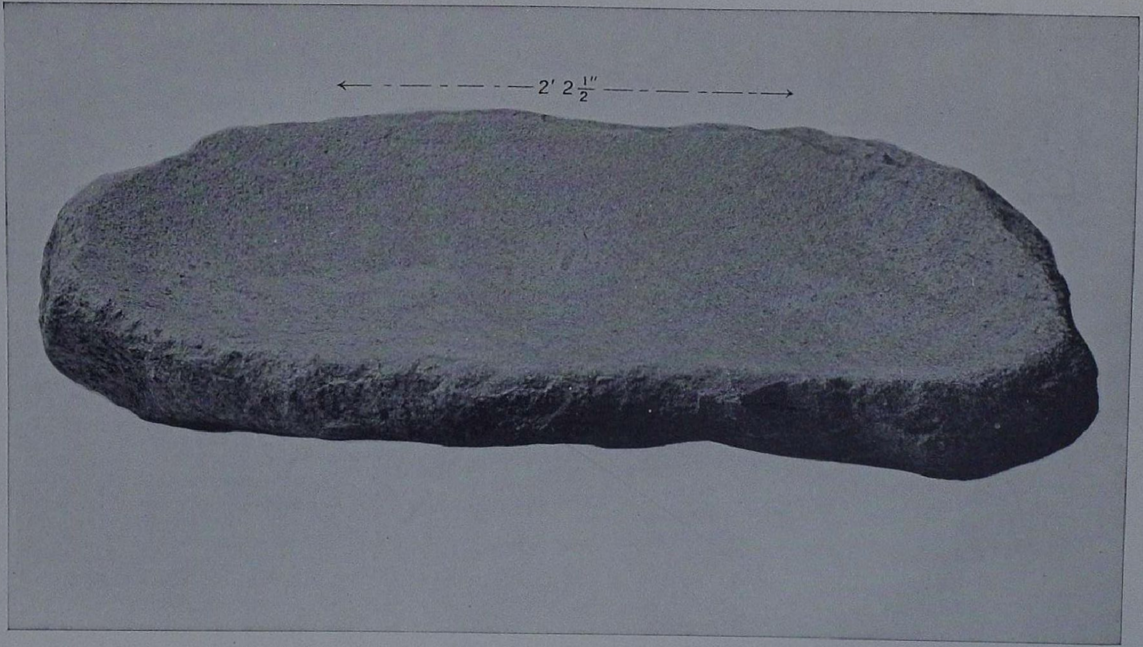
RIGHT SIDE.

Plate 6.

NEOLITHIC TOOLS.

Plate 7.

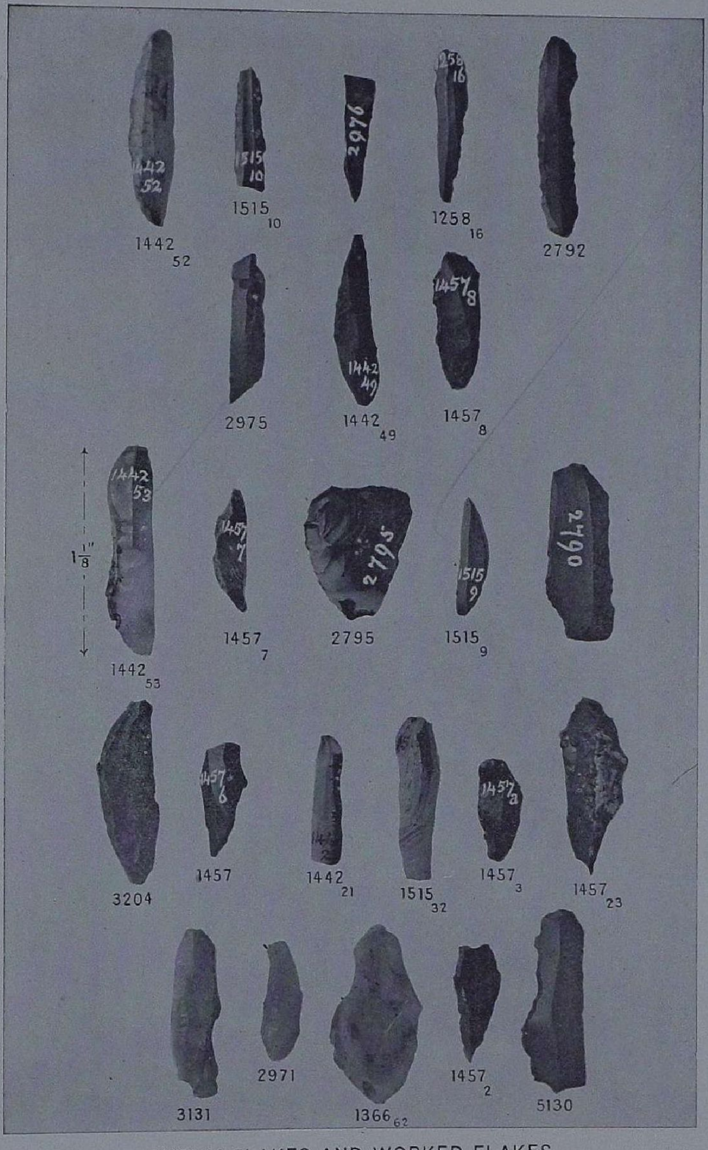
No. 2788, MEALING TROUGH, RAWALKANDA.
5" Deep.



No. 1828, MEALING TROUGH. BUDIKAL, ANANTAPUR DISTRICT.

Plate 9.

Plate 11.



PYGMY-FLAKES AND WORKED FLAKES.

Plate 12.

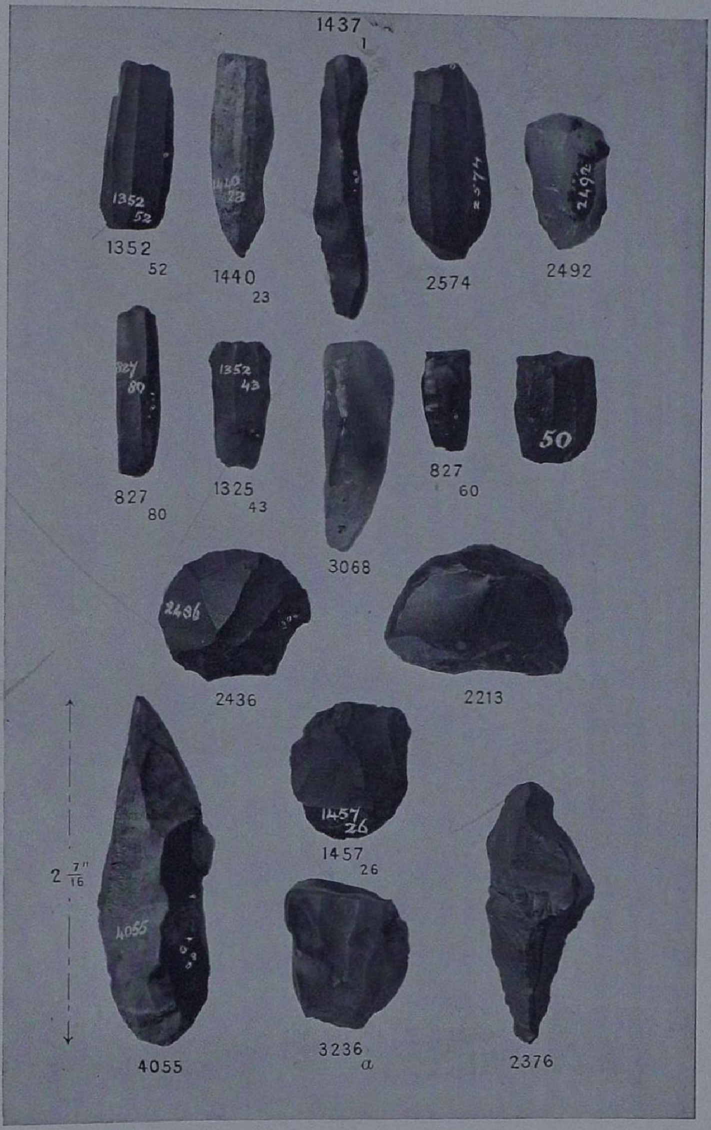
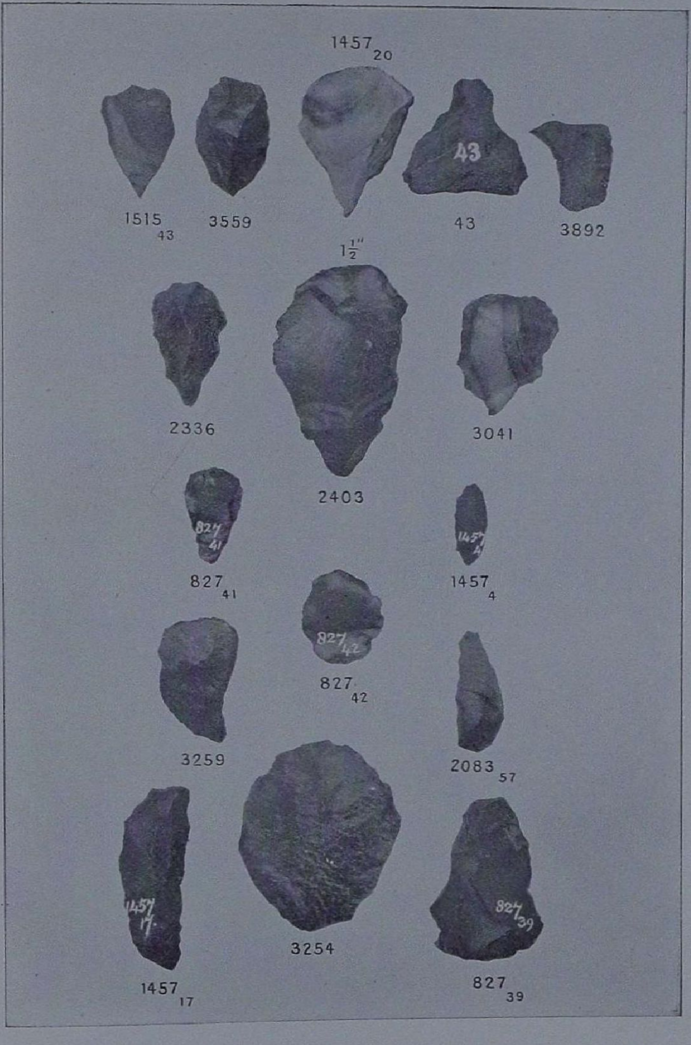
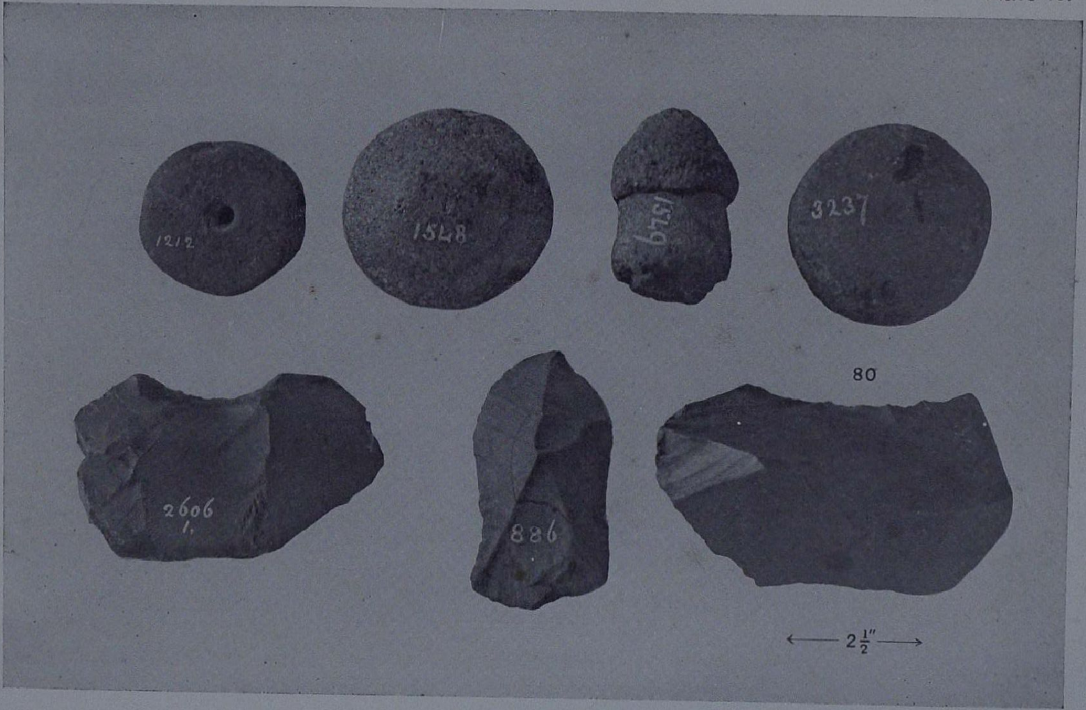

1437
1
1352
52
1440
23
2574
2492
827
80
1325
43
3068
827
60
2436
2213
2 7/16"
1457
26
4055
3236
a
2376

Plate 14.



1457 20
1515 43
3559
43
3892
1½"
2336
3041
2403
827 41
1457 4
827 42
3259
2083 57
3254
1457 17
827 39

Plate 15.

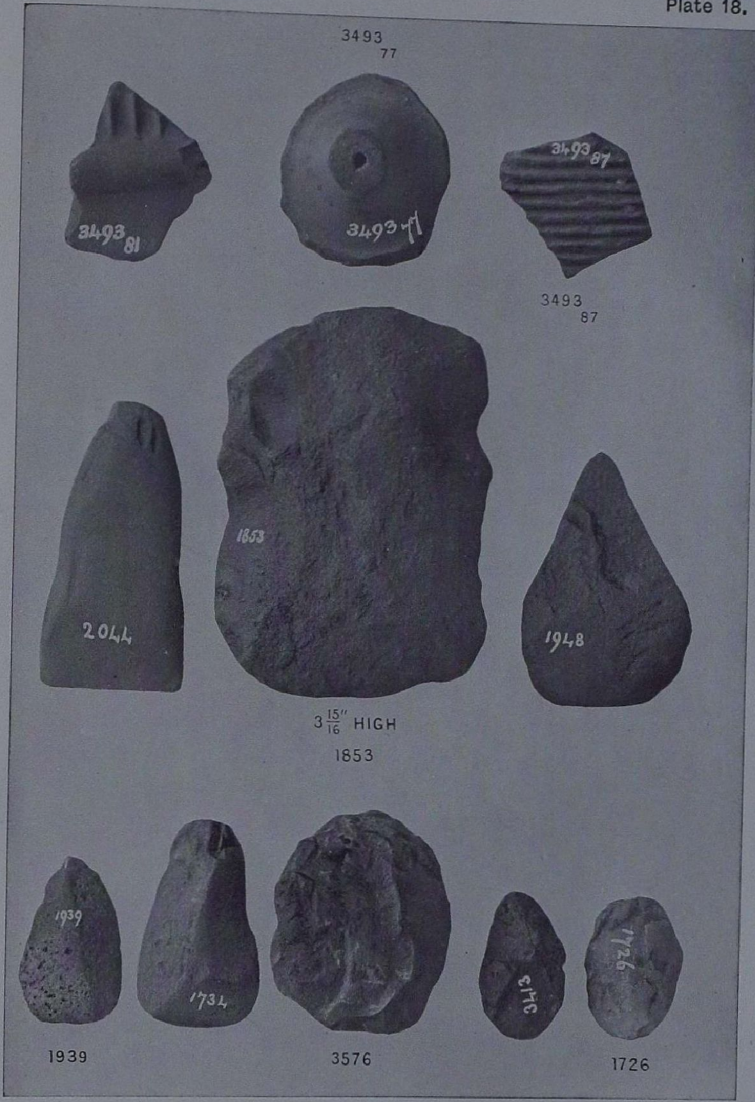


CARVINGS IN STONE.

Plate 17.

BEADS OF DIFFERENT STONES.

Plate 18.



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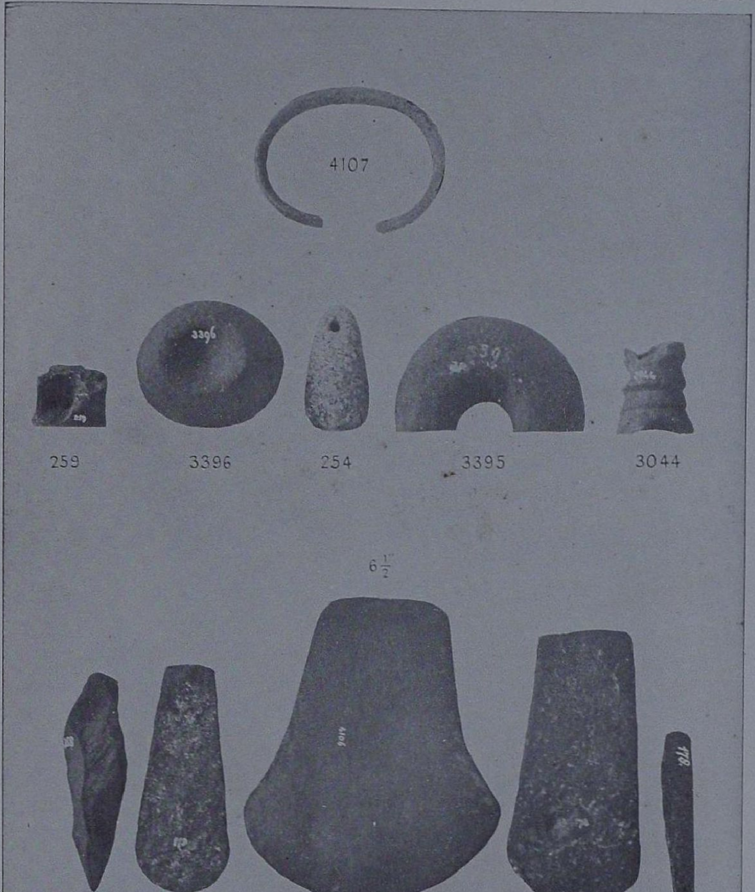

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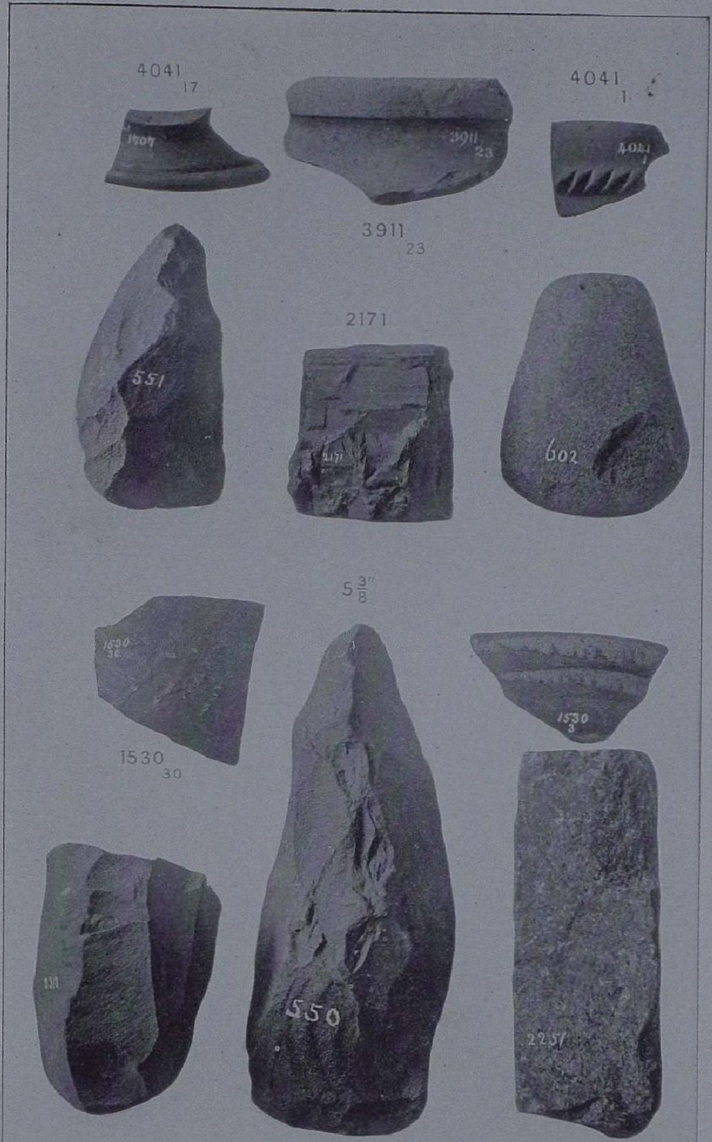
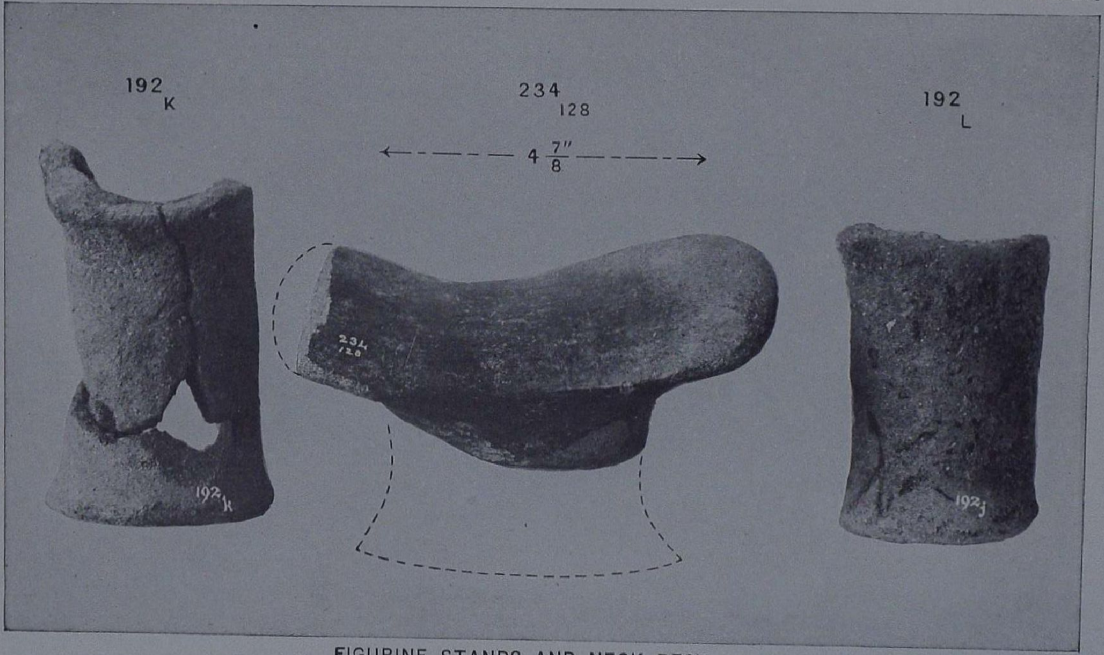


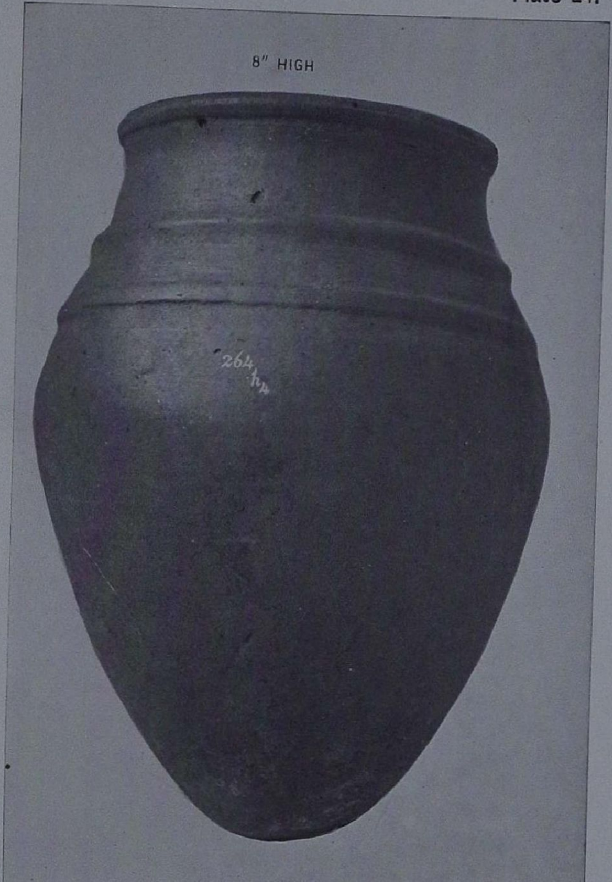
Plate 21.

Plate 22.



FIGURINE STANDS AND NECK REST.

Plate 24.



$9\frac{1}{2}''$

264 h_5

264 h_3

Plate 26.

PATPAD. EASTERN SITE.
4½" deep.

Plate 27.

Plate 28.

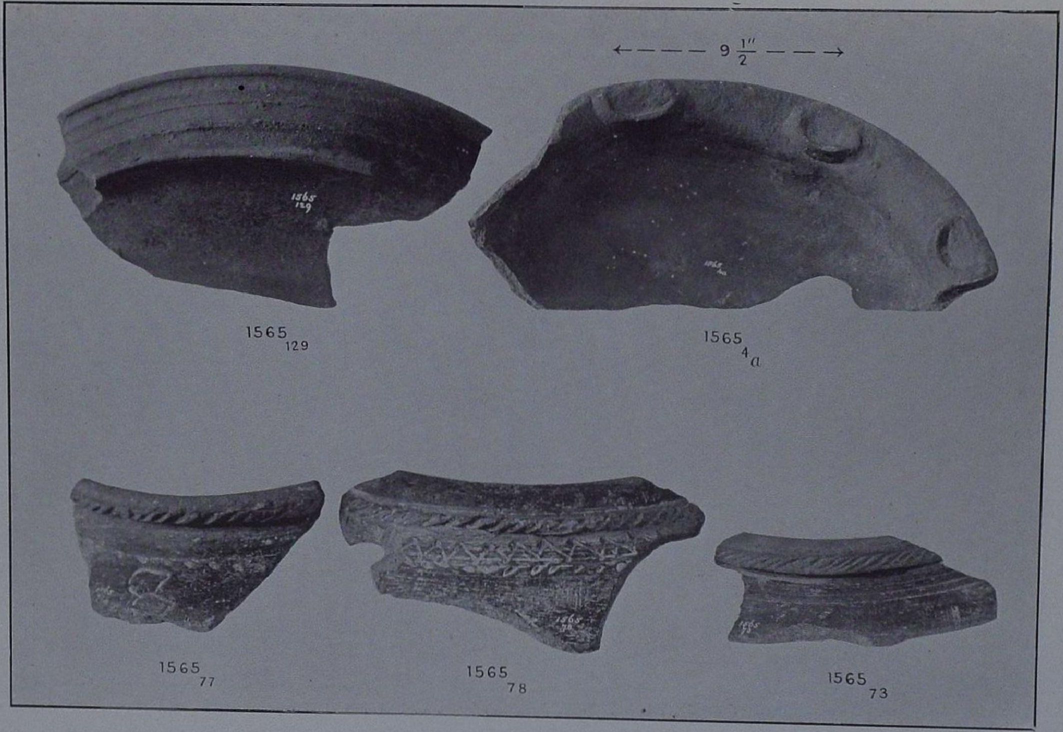
TOP OF LIP.

Plate 28a.

5⅝″

SIDE OF CHATTY WITH LEAF PATTERN, MALYAM.

Plate 29.



← 8 3/8" →

2055
1

234
113

234
125

234
90

252
87

234
109

234
38

234
115

234
80

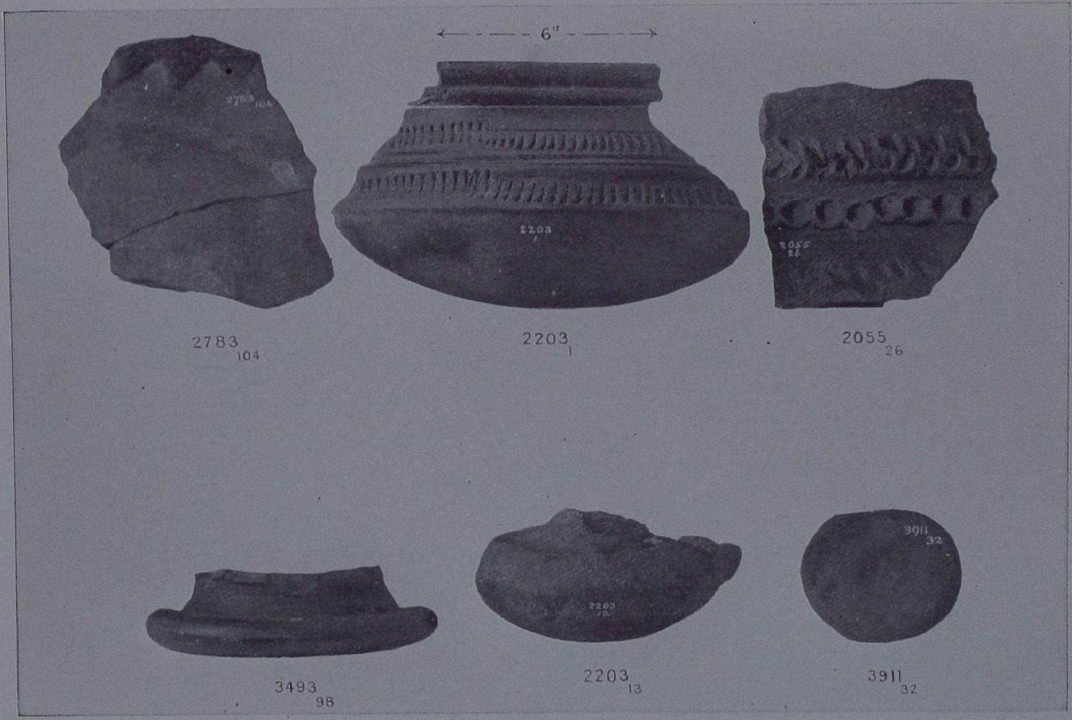
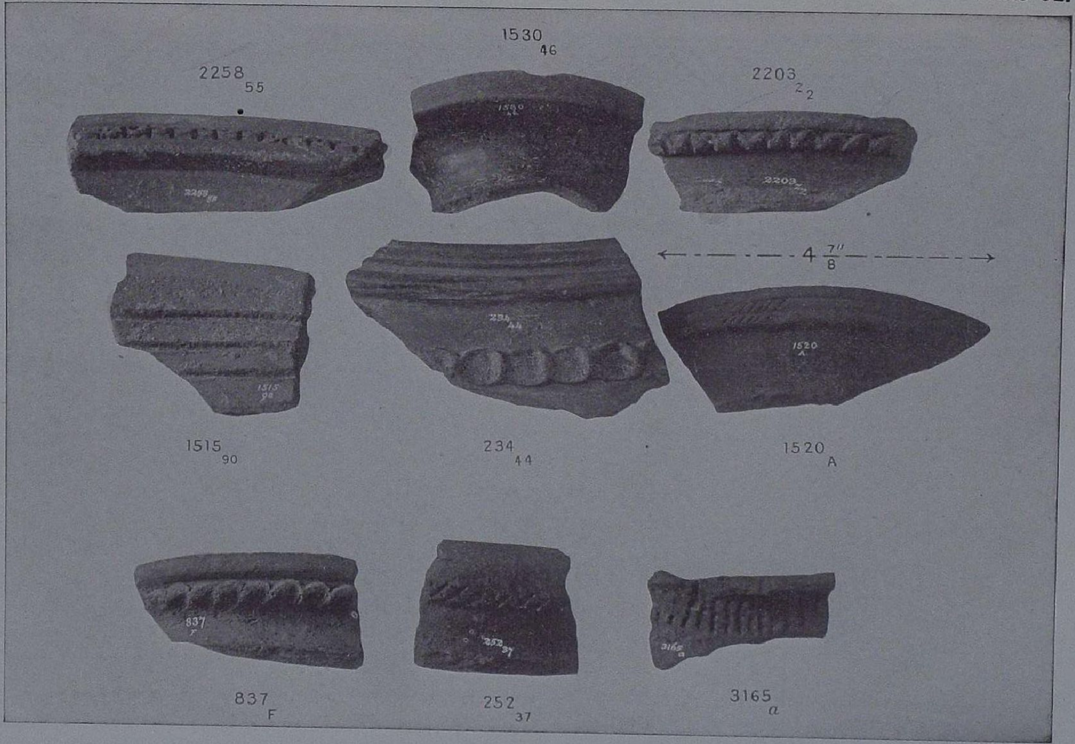
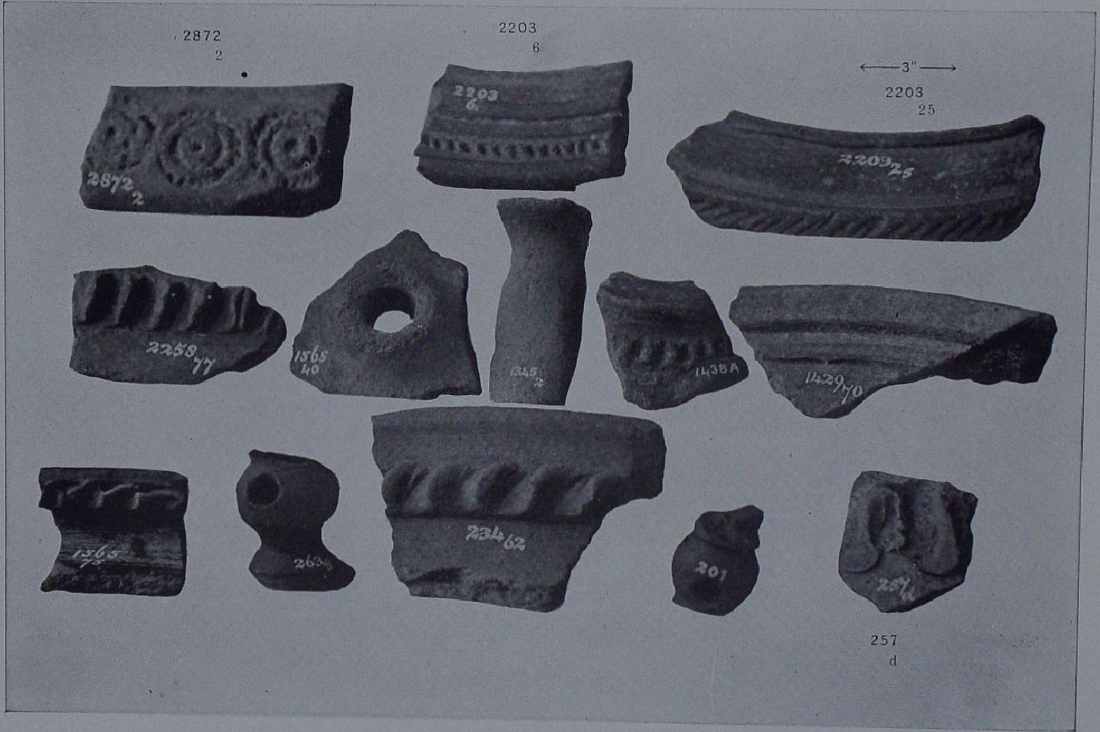

6"
2783 104
2203 1
2055 26
3493 98
2203 13
3911 32

Plate 32.



2258 55
1530 46
2203 2 2
1515 90
234 44
1520 A
4 7″/8
837 F
252 37
3165 a

Plate 34.



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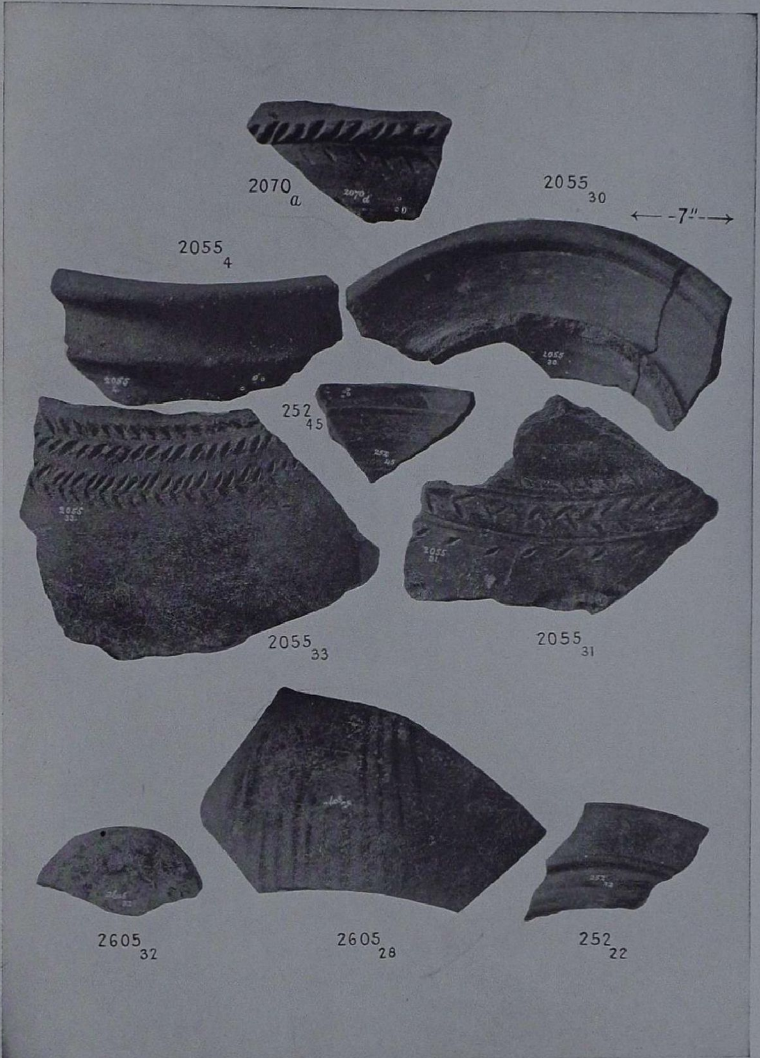
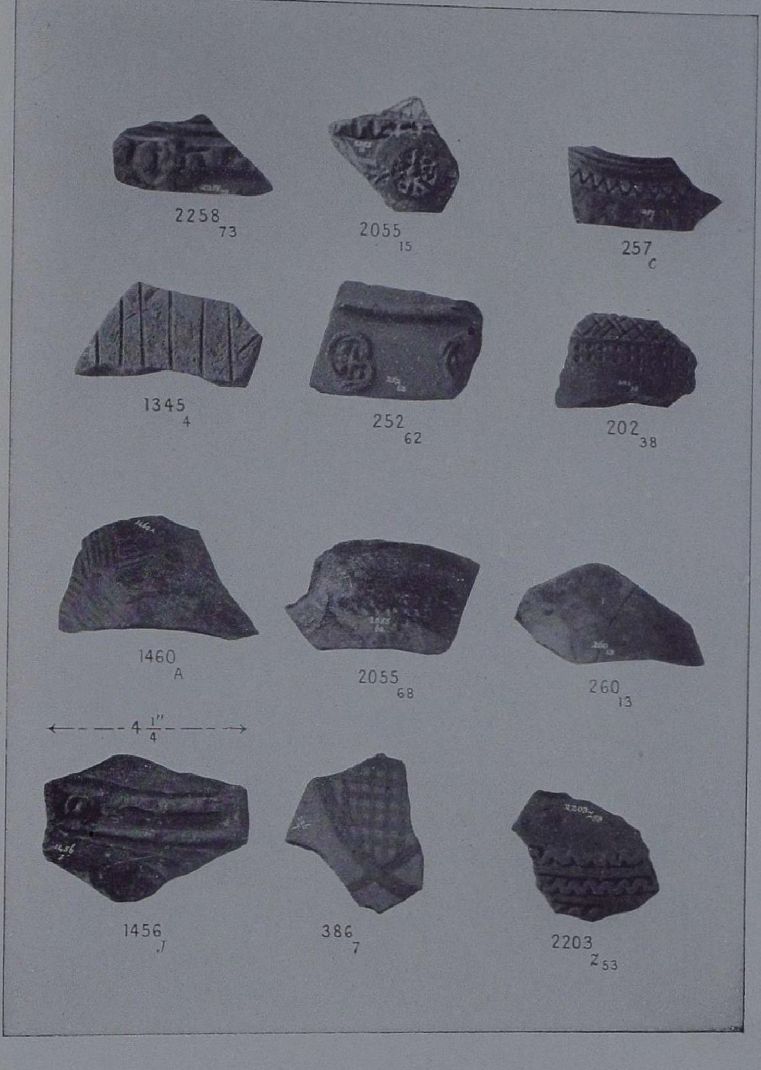

2070 a
2055 30
← -7"- →
2055 4
252 45
2055 33
2055 31
2605 32
2605 28
252 22

Plate 36.



2258 73
2055 15
257 C
1345 4
252 62
202 38
1460 A
2055 68
260 13
4 1/4"
1456 J
386 7
2203 Z 53

Plate 37.

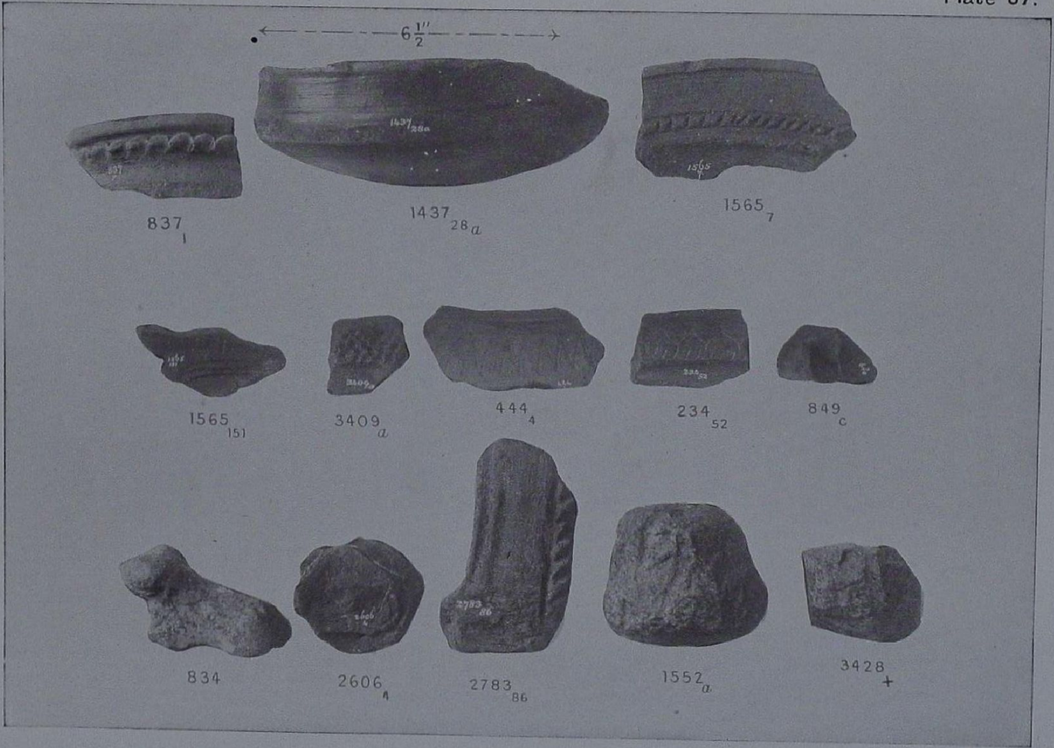
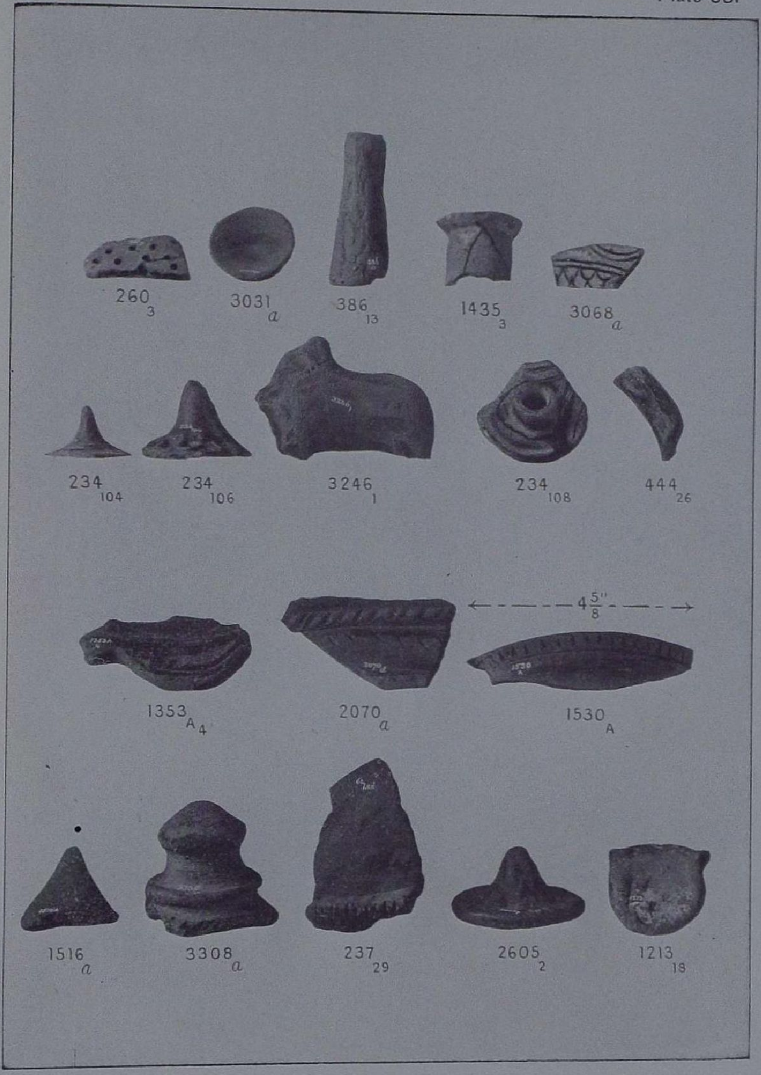
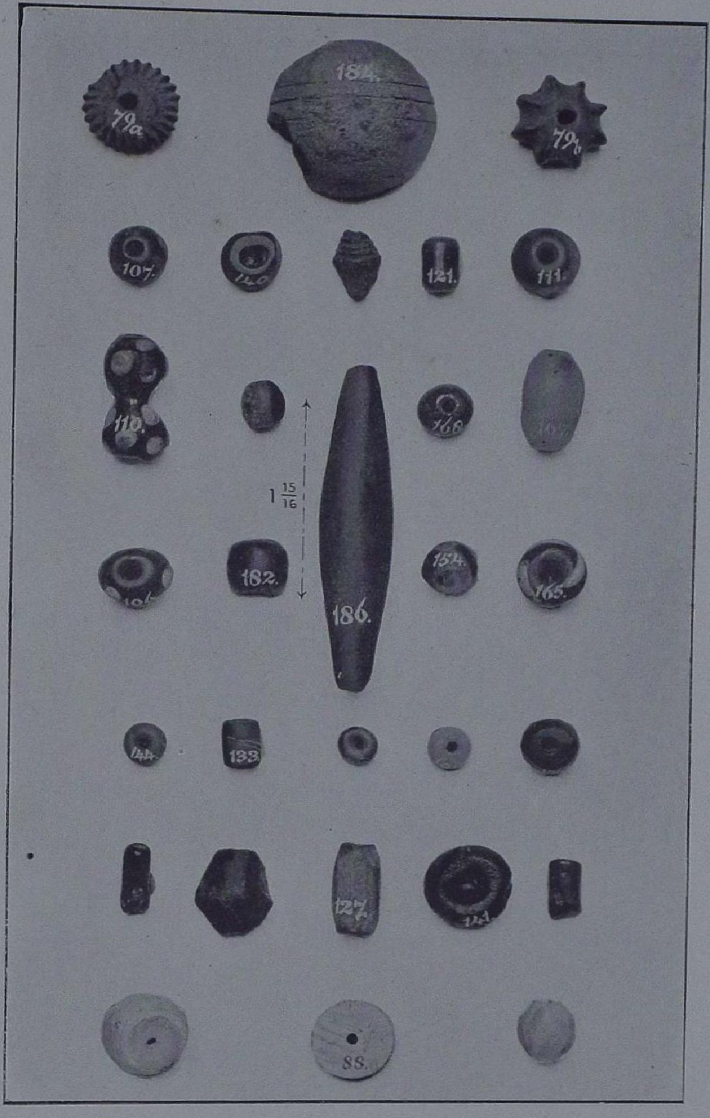

6 1/2"
837 1
1437 28a
1565 7
1565 151
3409 a
444 4
234 52
849 c
834
2606 4
2783 86
1552 a
3428 +

Plate 38.

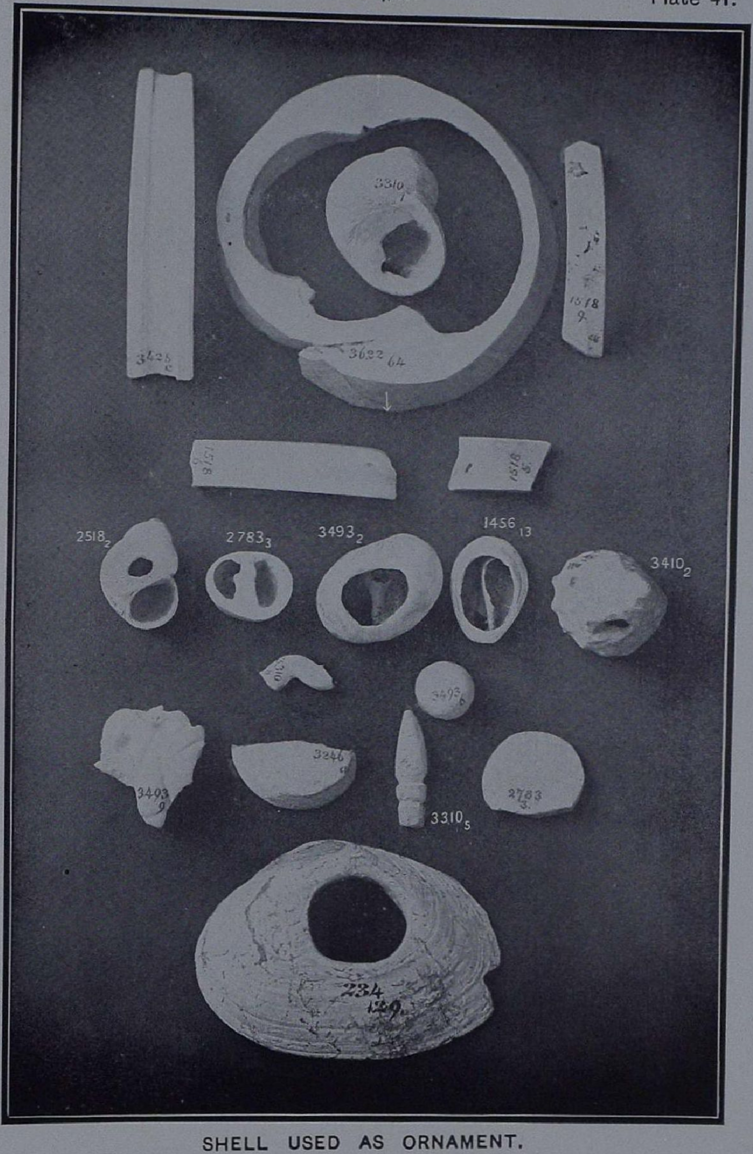

260 3
3031 a
386 13
1435 3
3068 a
234 104
234 106
3246 1
234 108
444 26
1353 A 4
2070 a
4 5/8"
1530 A
1516 a
3308 a
237 29
2605 2
1213 18



BEADS: TERRACOTTA, GLASS, PASTE & SHELL.

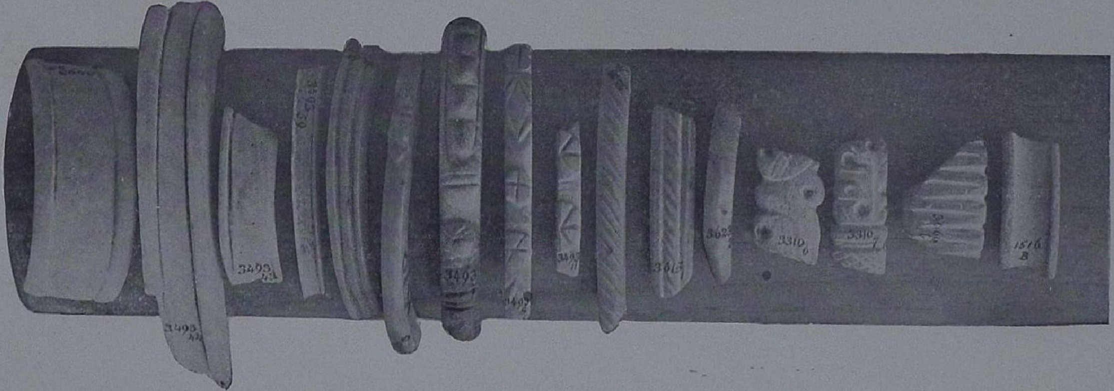
Diam 27/.16

Plate 41.

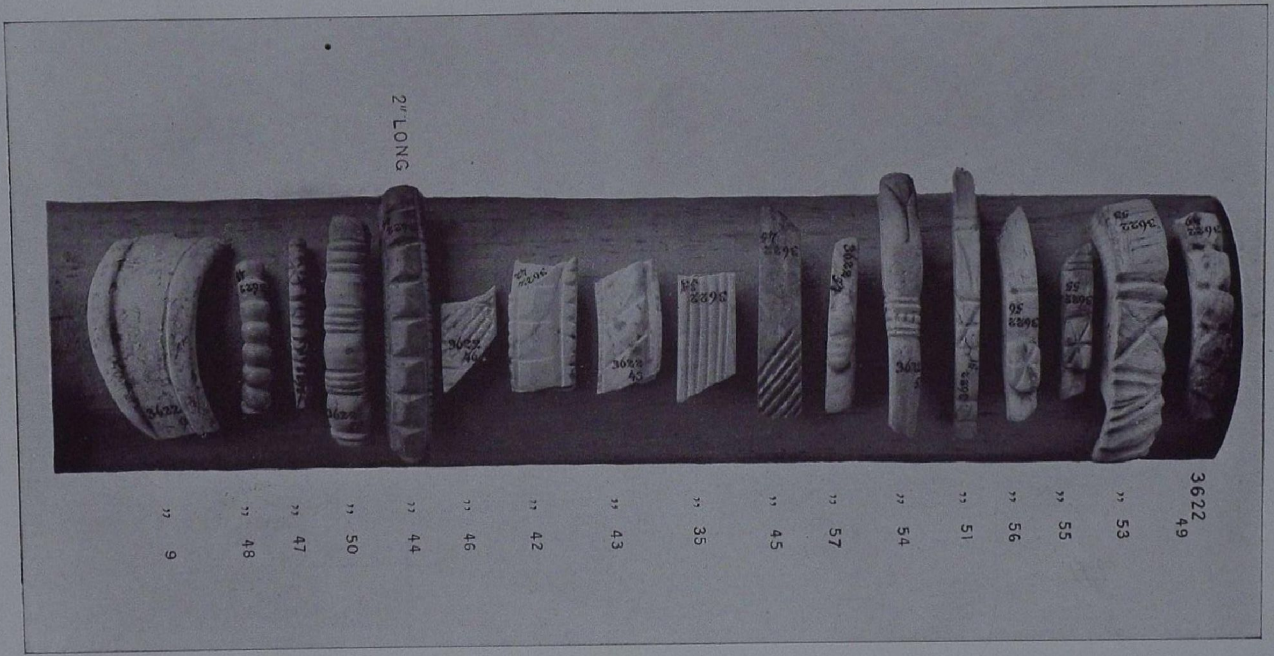


SHELL USED AS ORNAMENT.

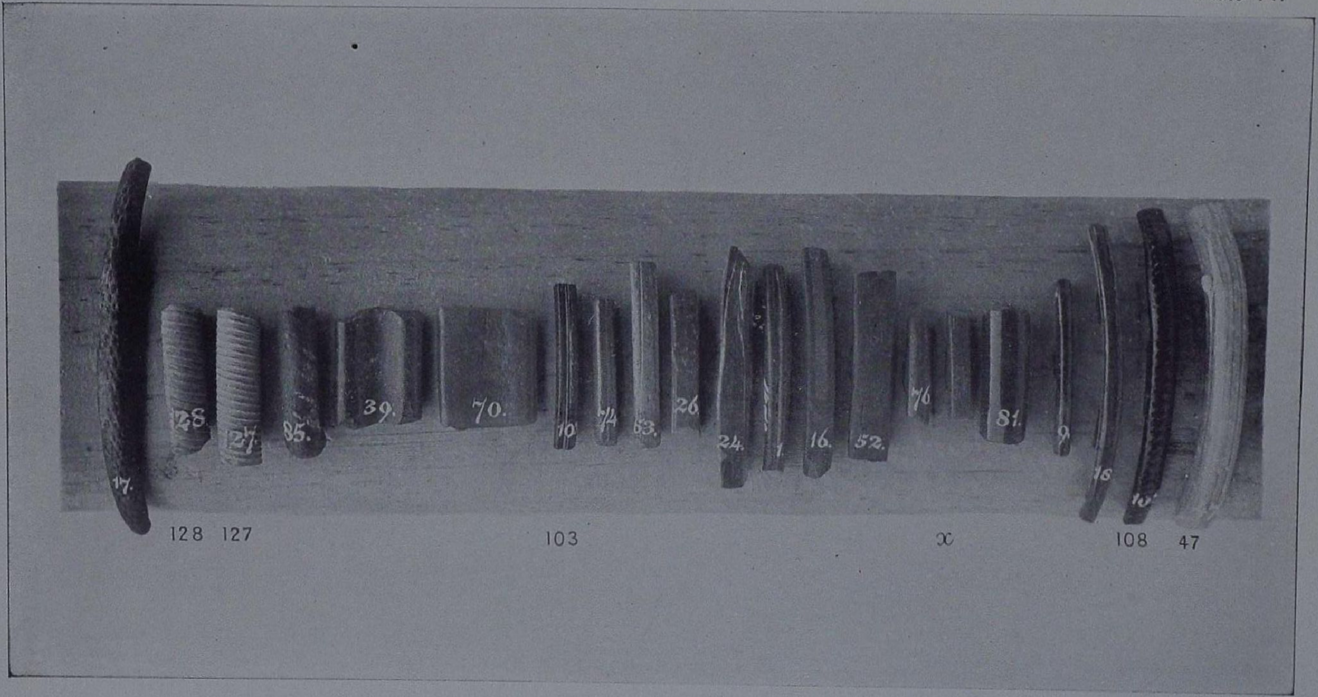
Plate 42.



BANGLES OF CHANK SHELL FROM VARIOUS LOCALITIES.

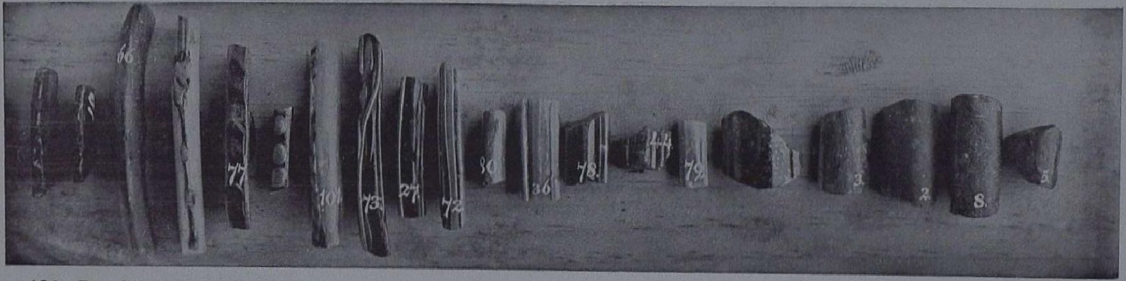


CHANK SHELL BANGLES FROM AMBAVALLI, AMRELI, BARODA, KATHIAWAR.



GLASS BANGLES.

1¼"
LONG



123 70 99 100 1615

K j

GLASS BANGLES.

Plate 46.

$3\frac{1}{8}''$

74

193 *a*

347

262

3315 *e*

260

261 *a*

444 8

266

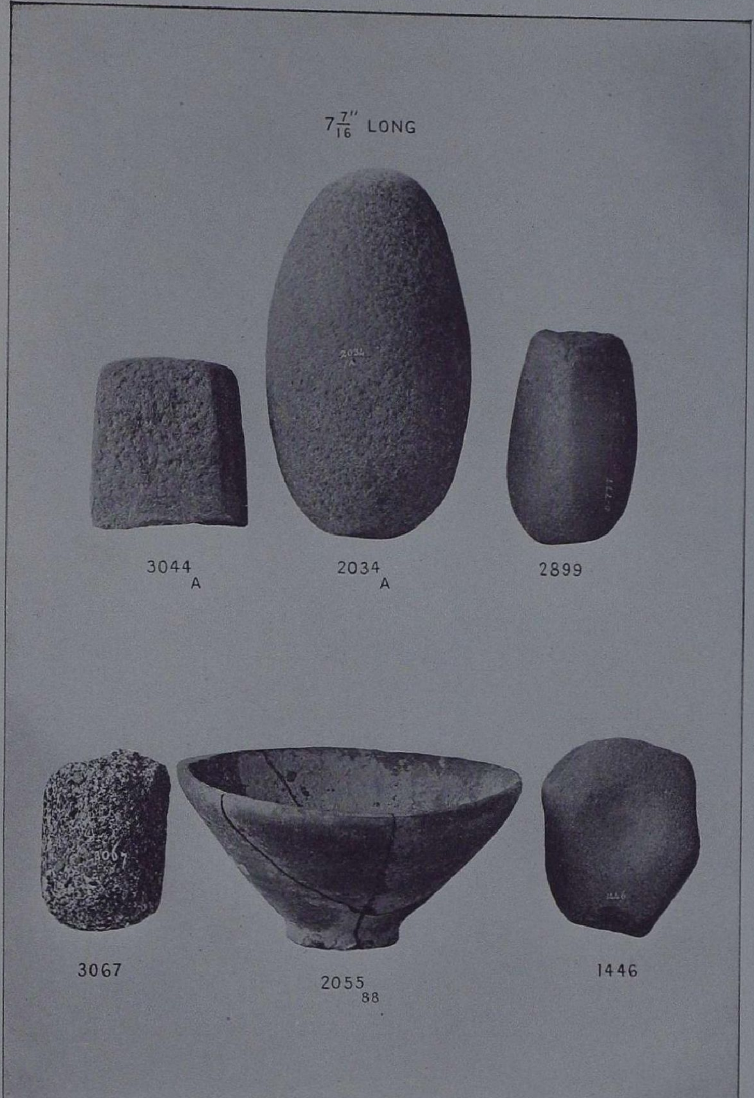
Height $1\frac{1}{8}''$

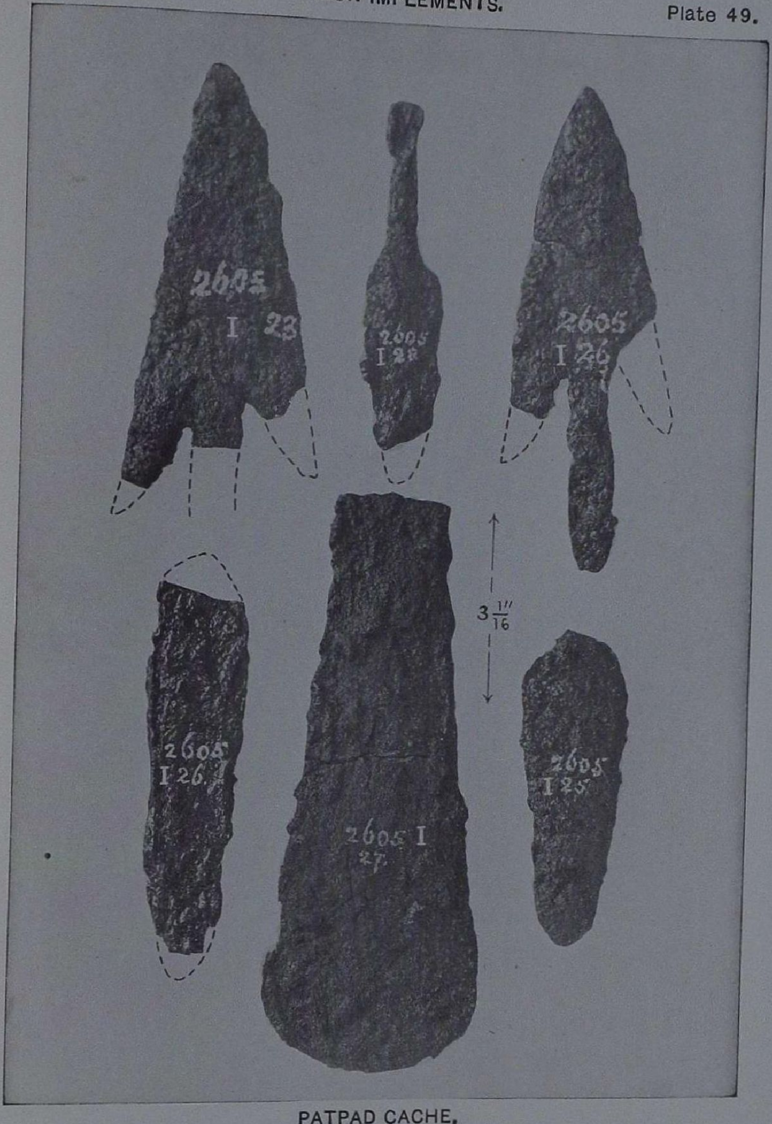
2739

265

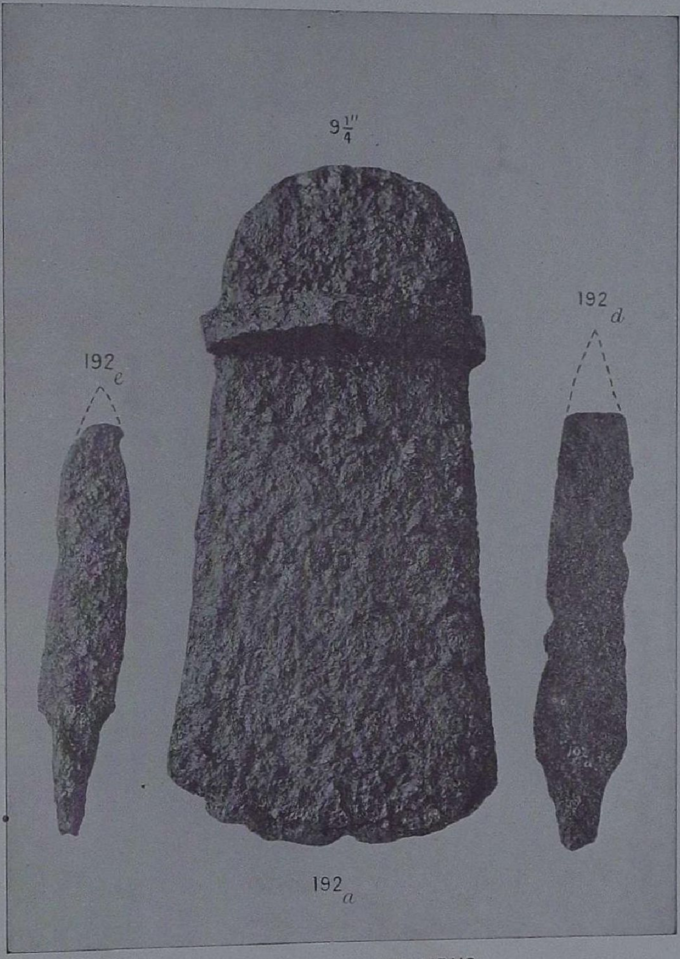
FIGURES RATHER ENLARGED.

Plate 48.





PATPAD CACHE.



OUT OF FUNEREAL URNS
SHEVAROY HILLS.

Plate 51.

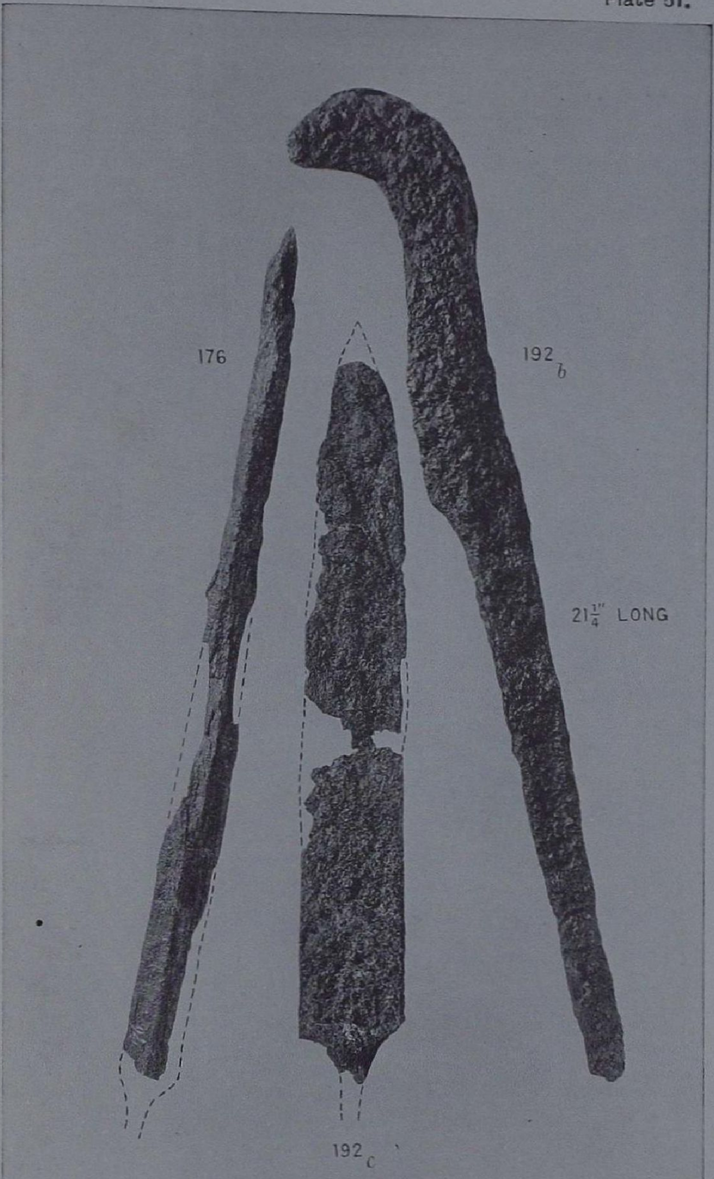


Plate 52.

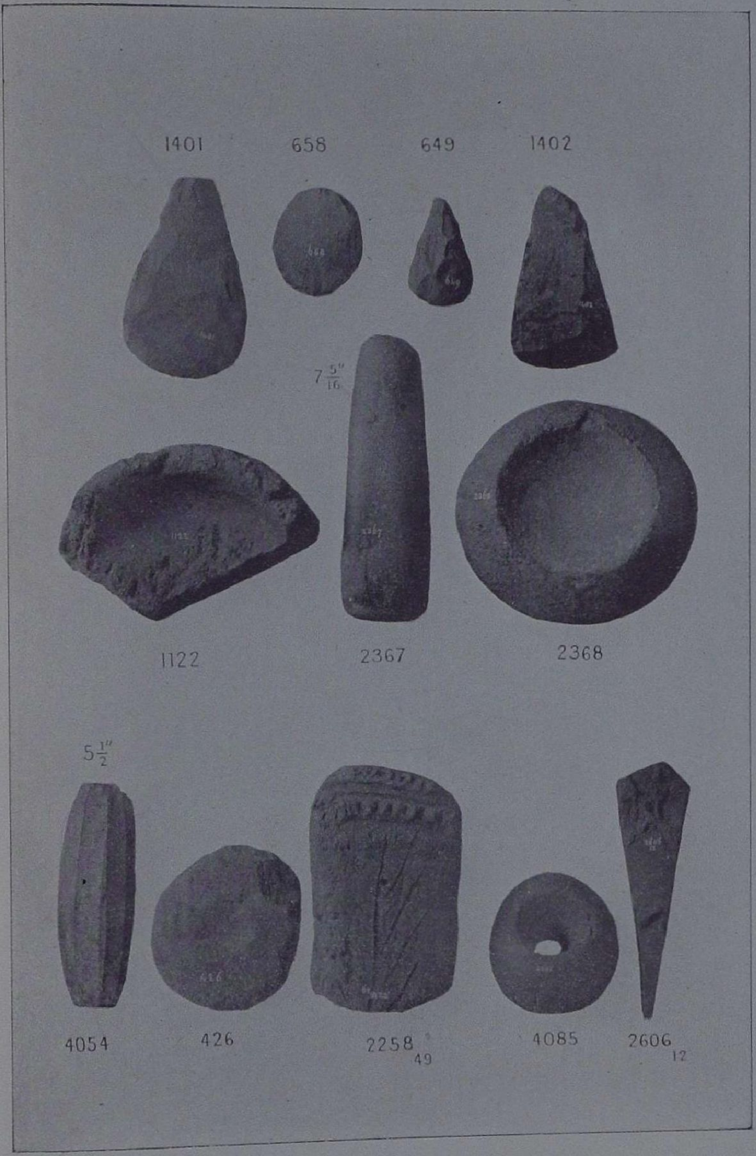
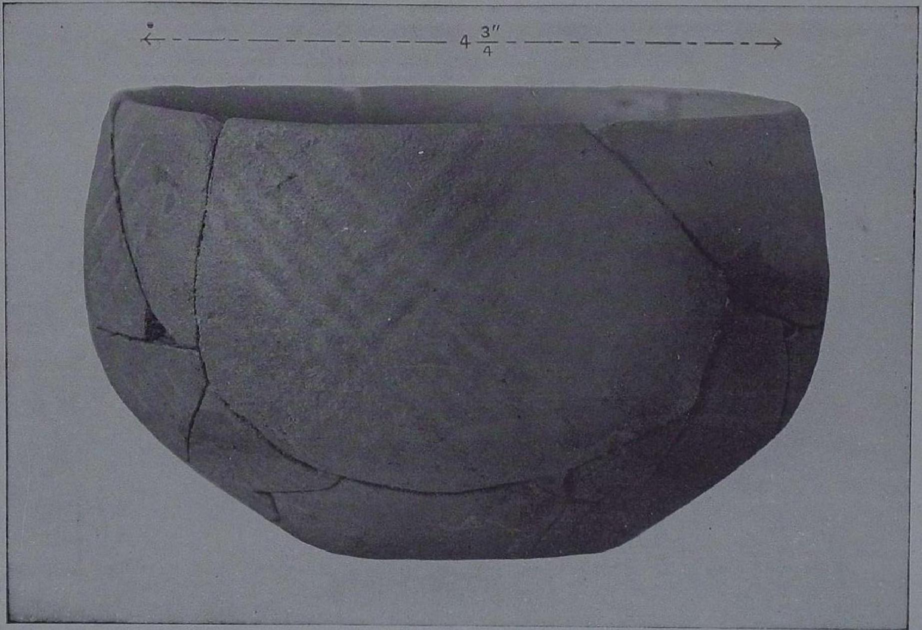
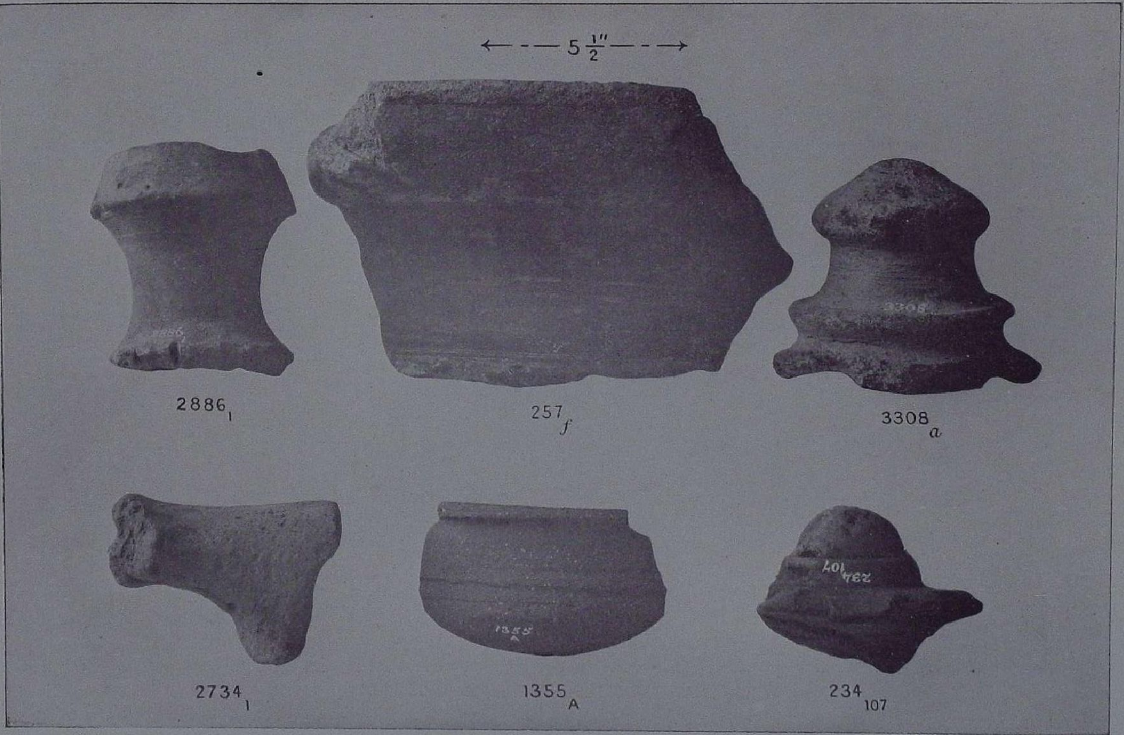

1401
658
649
1402
7 5/16"
1122
2367
2368
5 1/2"
4054
426
2258
49
4085
2606
12

Plate 53.



PAINTED BOWL FROM LOCALITY 122*a*

2886
16

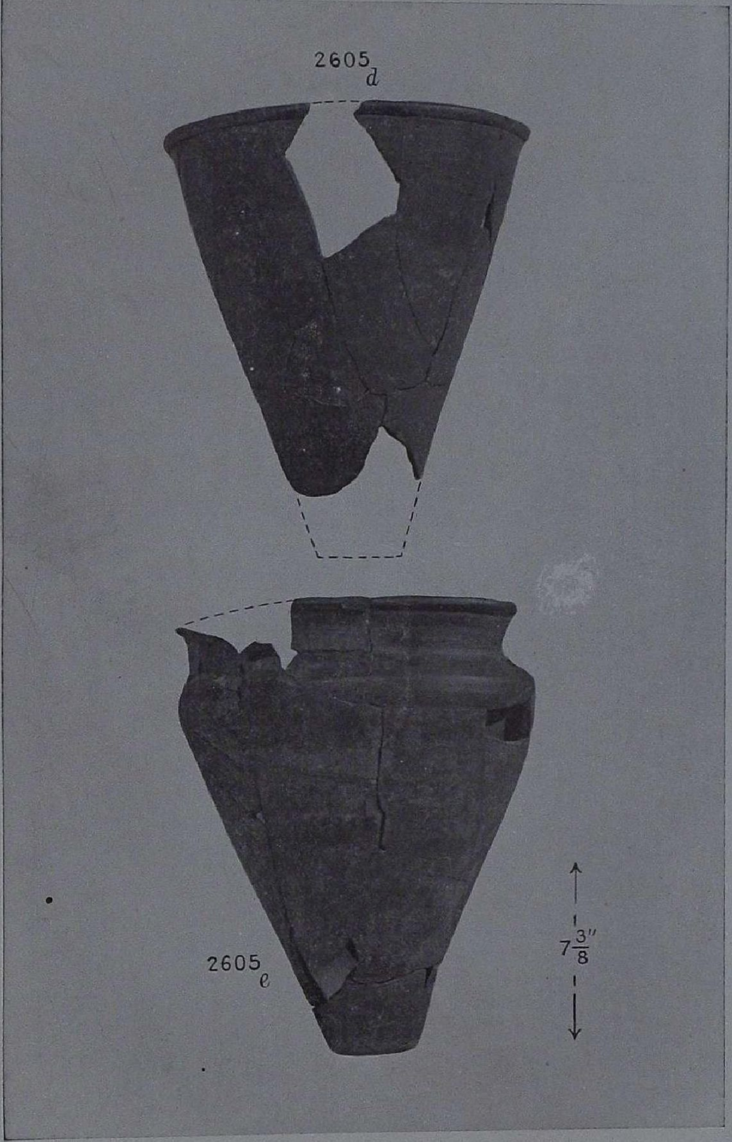


2886_1 257_f 3308_a

2734_1 1355_A 234_{107}

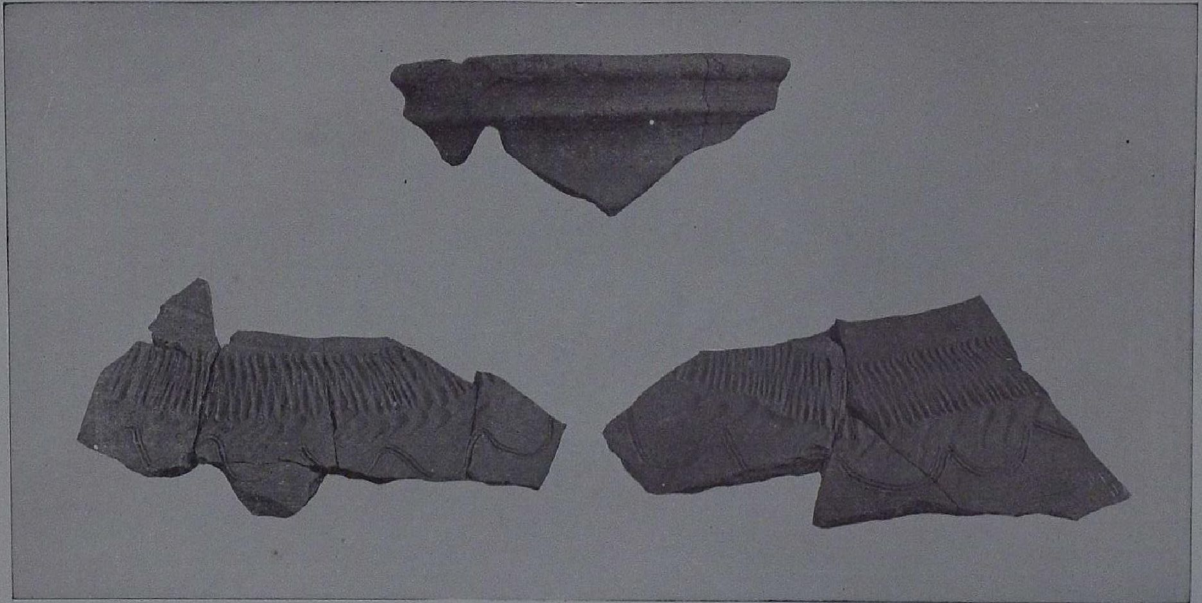
Plate 55.

BOWL-DISH ON RINGSTAND, BOTH
FROM THE PATPAD CACHE.



VASES FROM THE CACHE AT PATPAD.

FRAGMENT OF CHATTY WITH LINEAR TRACED PATTERN.
FROM TSANAGUNDLA DRUG, PATTIKONDA
TALUK, KURNOOL DISTRICT.



NECK AND SHOULDER OF 2335 $_a$

Plate 59.

Plate 60.

Plate 61.

Plate 62.

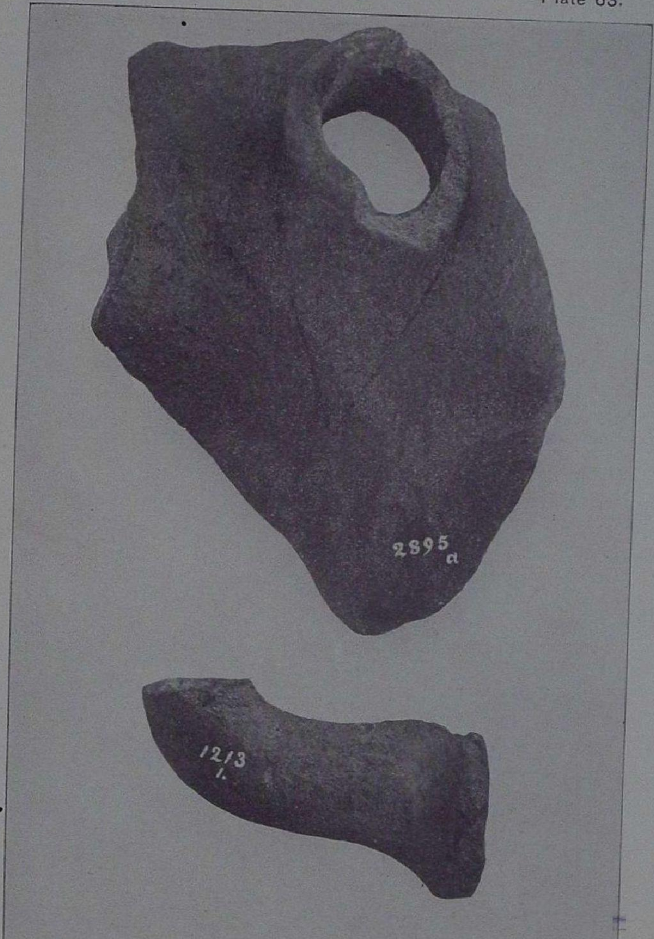

2895 a
1213
1.

PLATE 64.